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DARWINISM AND RACE PROGRESS.

J. B. HAYCRAFT.

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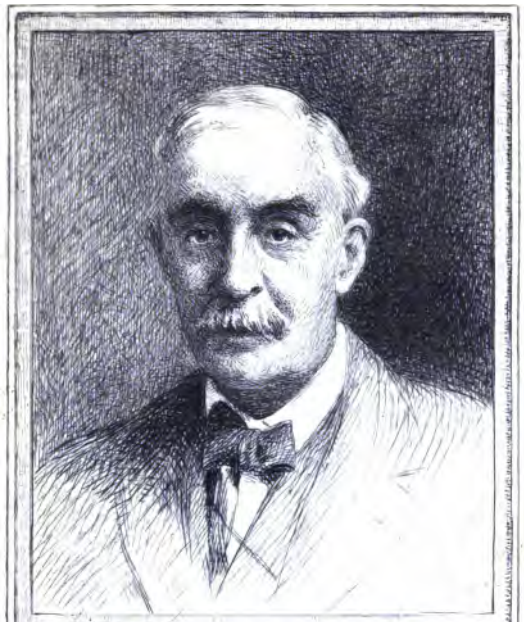

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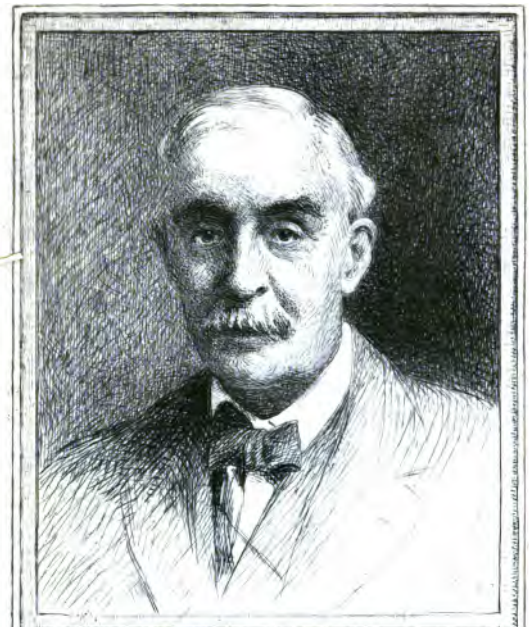

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DARWINISM AND RACE PROGRESS

DARWINISM

AND

RACE PROGRESS

BY

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PREFACE

In 1890 I gave a lecture to the Edinburgh Health Society, which appeared as No. 2 of their Eleventh Series. Its title is "The Importance of Ideals of Health, Beauty, etc., in Race Progress."

Much the same thesis considerably expanded was given by me in the form of three Milroy Lectures to the Royal College of Physicians of London in March, 1894, and appeared at the time almost verbatim in the *Lancet*.

The present volume contains these lectures

somewhat arranged to suit a less technically instructed audience. I am indebted to my colleague, Professor Richards, for his kindness and care in revising the proofs.

JOHN BERRY HAYCRAFT.

UNIVERSITY COLLEGE, CARDIFF.
18th October, 1894.

CONTENTS

CHAPTER I.

INTRODUCTORY.

PAGE

Muscle and Brain versus Political Organisation—The Muscles and Brains of a Race are not bound to decay—The Fall of Greek and Roman Political Organisation—The Permanence of the Scandinavian and Jewish Types—Possible Racial Degeneration in Spain—Our Power to ensure our own Racial Progress—The Knowledge we possess regarding the Laws of Racial Change—Evolution—Modern Philanthropic Effort—Are these conducive to Racial as well as to Individual Well-being? 1—18

CHAPTER II.

THE STANDPOINT OF BIOLOGISTS.

Lamarck's View on Heredity—Darwin's Law of Selection—Three Ideas involved in Selection—Selection is a Fact, not a Theory—How much is explainable by Selection?—Galton and Weismann—Are Acquired Characters Transmitted?—Many Cases of Supposed Transmission to be explained by Selection—Paucity of Experimental Evidence of such Transmission—The Reproductive and the Body Cells—Reproductive Cells unaffected by Local Changes in the Body Cells—Constitutional Changes may, though they rarely do, affect the Reproductive Cell—The Facts of Evolutive Selection known to the Gardener and Breeder - - - - - 19—43

CHAPTER III.

CAUSES AND SIGNS OF PHYSICAL DETERIORATION.

PAGE

Modern Care for the Individual—Preventive Medicine—Micro-organisms of Diseases and their Extermination—The Reproductive Cells as a Rule unaffected by them—Man has been selected by the Action of the Microbes of Fever—Leprosy an Exterminator of the Unhealthy—Germs of Phthisis and Scrofula our Racial Friends—If we stamp out Infectious Diseases we perpetuate Poor Types—Births, Deaths, and Marriages—Increase of Constitutional Weakness—Death-rate for Advanced Years on the Increase—Life Tables compared—Physical Degeneration of the Race already indicated - - - - - - 44—68

CHAPTER IV.

INSANITY AND ALCOHOLISM.

Nerve Derangements, Insanity—The Importance of preventing its Transmission—Marriages of Insane Persons—Alcoholism a Habit, and Alcoholism a Sign of Mental Instability—Drink is a Selective Agency—Parents who drink from Habit may have Debilitated Offspring—Preventive Measures—Drink among Australian Convicts—Drink and Prevention in America—Public Habit and Conscience the best Preventive—The Power of the Community over the Individual—The Necessity for replacing one Selective Agency by another—How it is that the Production of Children by Diseased Parents is tolerated—The Necessity for producing Posterity out of our Best Types - 69—89

CHAPTER V.

THE CRIMINALS, INCAPABLES, AND THOSE IN DISTRESS.

PAGE

Crime is often an Acquired Habit—The Innate Criminal—The Jukes Family—Intermarriage does not stamp out Criminal Tendencies—Segregation of the Criminal an Ultimate and Effectual Resort —Our Unfortunate Use of the Word "Poor"—The Unfortunate, the Aged, the Incapables and the Vicious are treated alike—Our Poor-Law Regulations are at Fault—The Idle and Vicious are Subjects for the Criminal Law—The Poor in Very Deed—Our Misguided Attitude to these—The Incapables—Segregation ultimately required for their Elimination—Incapables to be treated like Chronic Hospital Patients - - 90—110

CHAPTER VI.

COMPETITION.

Competition of Brain against Brain—Does the Race show Increased Brain Capacity?—The Neolithic compared with the Modern English Skulls—Abeyance of Brain Development since Neolithic Times—Social Communities do not permit of the Destruction of the Less Intellectually Capable—Human Brain Power results merely in Wealth Accumulation—Further Study of Individual Competition—Those competing are handicapped by Property—Property is not always acquired by the Most Capable—Property Holders Less Capable than Property Acquirers—The Poor Child is scratched against the Rich Child—Modern Democratic Attempts to equalise the Struggle—Those who succeed are not always the Best - - 111—134

CHAPTER VII.

STERILITY OF THE CAPABLES.

PAGE

Are the More Capable relatively sterile?—If so, we are breeding from our Incapables—Capable and Ambitious Men marry Late in Life—Many Unmarried Persons among Upper Classes—Lower Class Marriages are the Most Prolific—Their Infant Mortality is Greater—Artificial Restriction of the Family—Fertility of French and English Marriages Contrasted—Possible Swamping of the Capables by the Incapables—Artificial Restrictions at present most disastrous - - - - 135—153

CHAPTER VIII.

OBLIGATION IN PARENTHOOD.

Are we prepared to carry out Selective Methods?—Rights of the Individual, and Obligations to the Community—Rights of Children and our Obligation to them—Our Sense of Obligation is Developing—Social Philosophers and Social Reformers—Segregation is not yet practicable—Segregation no New Idea, and ultimately a Necessary Practice—The Masses must be taught the Main Facts of Heredity and Evolution—The End and Aim of Marriage—Our False Ideas regarding Marriage—The Stream of Life - - - 154—170

APPENDIX - - - - - 171—180

DARWINISM AND RACE PROGRESS.

CHAPTER I.

INTRODUCTORY.

Muscle and Brain versus Political Organisation.

IN the history of the world, nations have arisen from comparative obscurity, have occupied positions of eminence and power, and have then sunk into obscurity again. The Egyptians, who built their pyramids and temples by the hands of the peoples they had conquered in war and enslaved, were themselves conquered by Greeks; and these conquerors, at first ignorant and savage, developed on the bases of Eastern and Egyptian civilisation to a point never before reached. But the Greeks in their turn were replaced by the younger Latin race, who were also at first less civilised than the nations they conquered.

The Romans then developed and established an empire, which men believed would be everlasting, but it, too, disappeared, to give place to the Teutonic states of modern Europe. So strikingly alike in their progression have been the histories of the peoples of the past that it is quite a commonplace to hear the life of a nation compared to that of a man as being a history of growth, maturity and decay.

But the analogy is at most a very imperfect one, and, if content with having made it, we leave the subject, we shall fail to note the real facts of racial development as indicated in the pages of history.

We may regard a nation from two points of view. First, we may look at the muscle and brain power of the individuals who comprise it; secondly, we may view it as a political organisation struggling against the effects of climate, geographical position and other rival organisations. These aspects are, of course, not mutually exclusive, for the success of a nation in its political struggle will depend in great measure upon its innate muscle and brain power; but, on the other hand, a nation possessing admirable innate or organic qualities may fail as a political organisation on account of insurmountable obstacles placed in its way. When therefore we read of the fall of the Roman Empire or the conquest of the Greek states, we may be dealing with a question of actual racial and organic deterioration

comparable in some slight degree to senility; or, on the other hand, we may have before us a question entirely apart from this, that of the struggle of a people against obstacles which have at last become insuperable. It will be necessary to examine the facts of history in greater detail in order to find out whether a race undergoes of necessity any organic change comparable to growth, maturity and decay, exclusive of the changes which may occur in the political organisation of the race and its fortuitous position in respect to other organisations.

The Muscles and Brains of a Race are not bound to decay.

We are dealing in the following pages with race rather than nation; with muscle, blood and brain, rather than with political power and influence; let us turn then to history in order to find out whether or not organic deterioration must actually close the history of every race, for if this is the case, our studies of racial change, though of none the less intellectual interest, will have lost their promise of practical utility. But, fortunately for the hopefulness of our future work, we may anticipate by saying that history shows us that the innate and organic is that which is most permanent and lasting, and that change and catastrophe in a nation's career have in most

cases been due to circumstances which we may term surrounding or accidental. We shall see that races, unlike individuals, may remain through the whole of their historic period without any sign of organic decay, but that the organisations, on the part of individuals of the race for purposes of trade or protection, may be prone to dangers which sooner or later overtake them.

The Fall of Greek and Roman Political Organisation.

A few illustrations will assist in making these points clear, and we may begin with the fall of the Greek states under Macedonian rule. It is here quite wrong to assume that the Greeks were at the time of their first conquest a deteriorated race; individually their conquerors were probably inferior to them; indeed, Alexander, the Macedonian, is reported to have said in a burst of passion, "The Greeks are demigods among Macedonian brutes." The Greeks from earliest times lived in small and independent states, jealously competing with each other, and unwilling to join hands in the face of a common danger. Their political organisation was from the first of the weakest kind, and they were at all times in their history liable to fall a prey to any aggressors who might have a stronger and bigger political organisation than theirs. This want of cohesion all but gave Greece to Persia;

indeed during the Persian invasion the independence of Greece was almost lost owing to the selfish neutrality or active treachery of several Greek states. It is evident, therefore, that the want of cohesion between a collection of small states carried with it an element of danger, and that the chances were that they would fall a prey sooner or later to foreign conquest. In the case of the Roman Empire we are dealing with a political organisation which has a place in the world's history only second in importance to that of the British Empire. In its growth, maturity and fall, we do not trace the history of any particular race, for it bound together nearly all the ancient world. It is said that when Constantine removed the seat of government from the Tiber to the Bosphorus, there were no Romans of pure blood in Rome itself, and the inhabitants of Rome, who migrated with Constantine, and took up their residence in Constantinople, soon lost even the Latin tongue, and Greek became the language of the Eastern Roman Empire. But this organisation of Greeks, Thracians, Persians, Egyptians and Hellenized Asiatics lasted till Constantinople was taken by the Turks in 1453, and here the climax was due to other causes than those resulting from internal racial decay. Constantinople, the gate of the East, was by its position the richest and the most powerful city of the Eastern world, and while this was so, the organisation of which it was the centre re-

mained comparatively secure. When, however, the merchants of Genoa and Venice opened up other routes of trade, the Eastern Roman capital lost its importance by the source of its power being diverted into other channels, and it was conquered by a race that formerly it had held in check. With the conquest of Constantinople the organisation of the Eastern Roman Empire ceased to exist.

These two examples will serve to indicate how slow must we be to assume that race deterioration has occurred merely because a state or empire has fallen to the ground.

We shall seek in vain either in Greek or Roman history for any answer to the question, "Must a race sooner or later originally deteriorate?" During the Roman Empire so great a commingling of blood occurred, and the modern Italian is so different—as far as race is concerned—from an inhabitant of the peninsula at the time of the Cæsars, that a comparison of their qualities would not give an answer to the question we are seeking. The same objection would be raised to a comparison between the modern Greek said to excel even the Jew in barter (the chief outlet to his intelligence), and a Greek of the time of the Macedonian conquest, because in the interval race intermixture has been incessant. There are, however, many examples of races which have existed through long periods of time without mixing to any great ex-

tent with their neighbours. If we can find amongst these a single example in which their physical and mental powers have shown undiminished activity, this will serve to establish the fact that racial decay is not a necessary termination to the history of a people.

The Permanence of the Scandinavian and Jewish Types.

Bearing this in mind, it is interesting to turn to the Scandinavian races from which we spring. These races, when kept as far as possible from interbreeding with other races, have shown wonderfully persistent characteristics for a great many centuries. For their powers of conquest and settlement, witness their early occupation of the sea borders of Britain, Iceland and Normandy, their expeditions to the Mediterranean, and even to North America, of which they were the first discoverers: these are the precursors of our British colonisation on a larger scale. The Lothians of Scotland are to-day peopled by almost as pure a type of Scandinavian as you will find in Bergen or Trondhjem, and they are perhaps the hardest headed, as they are the longest limbed, of all the British. In Iceland, a country peopled by those who fled from the rule of Harold, the first king of Norway, because they were not used to kings, and

would not tolerate a novel form of government, we have a pure race isolated for centuries, who to-day have the same characters as their Norse forefathers, and who have developed and are developing as far as their narrow limits will permit.

In even a more striking manner the Jewish race illustrates the same point. Always of striking capacity, they suffered national extinction at the hands of an enemy who had, so to speak, specialised in the ways of warfare. So far from this national extinction indicating any race enfeeblement, we have clear proof to the contrary, for to the present day the Jews are more than fairly represented amongst artists, musicians, scientists and men of affairs; and in our own mercantile community, with the disadvantage of having two holidays in the week against the Gentile's one, the Jew more than holds his own in the race for wealth.

Possible Racial Degeneration in Spain.

We are not, however, bound to assume from these two examples that, *bar* political catastrophe, a race will always progress, or even continue to possess its original characteristics.

In the case of Spain, a country which at one period of history took a distinct lead amongst Euro-

pean nations, and explored and conquered large areas in America and elsewhere, we find that to this activity followed a period of lethargy and want of initiative. But even here it would be wrong to assume a condition of national senility, for old age in the individual is, in the millions of cases under observation, an inevitable necessity, while the decline of Spain was due to causes which might have been avoided, and the ill effects of which might have been readily removed.

The Spaniards, unlike the English and the French, mix freely with lower races, and in the Spanish colonies the race diluted its blood, and thus influenced the home country. Not only was this so, but there can be little doubt that much of that which possessed intelligence and independence was taken out of the race during the days of the Inquisition. When we remember that, from 1481-1808, no less than 340,000 persons were punished, of whom 32,000 were burnt alive, and that thousands who represented the nation's capacity and moral backbone left the country, we need hardly wonder at the inevitable result. If this be a true reading of history, we have here a case of organic race deterioration, but it must be noted that it was brought about by conditions which were under control, and, unlike causes of true senility, were not universally operative.

Our Power to ensure our own Racial Progress.

We may conclude, I venture to think, from these examples in history, that a race may continue to preserve its racial character for long periods of time without deterioration, but it is suggested to us that there are distinct dangers to be understood and avoided. If, therefore, we ask ourselves, "Is our own preservation as a race possible?" the answer comes to us that, guided by the historical knowledge we possess, and with our better acquaintance with man himself, and the laws of his growth and well-being, we have an advantage over all who have gone before us, so that, if misadventure should befall us, it will be most assuredly because of our own indifference, and because we wilfully shut our eyes to the light of truth.

It would be well once more to emphasise the difference between what is meant by racial preservation and the preservation of political organisation. It would be quite possible for our empire to crumble away from us. It is a political organisation depending upon ties of mutual advantage and sentiment, and likewise upon the tolerance and weakness of other nations. But we may lose our colonies, and be stripped of our prestige, and yet remain, man for man, as fine individually as when we gained them; for bones, muscle and brains are one thing, whilst

the political union that binds us together is another.

The Knowledge we possess regarding the Laws of Racial Change.

A knowledge of the individual must be obtained before we can fitly study the facts observable when individual succeeds individual, making the generations to follow each other, and thereby building up the history of a race of men. The facts of individual development, both in the case of man and of the lower animals, have already been minutely studied. We know much of the life-histories of many species, and can say what conditions are favourable and what are inimical to healthy and active individual existence. Much of this information has been turned to practical uses, and preventive medicine has arisen as a noble art, which, by its application, permits of a successful war against disease and even against death itself. We have also learned much of that longer history which traces out the life of a species, generation after generation, and notes those changes for the better or for the worse which occur in the characteristics of groups of the individuals of those species as they succeed each other. We have of late years accumulated in government returns vast quantities of exact statistical information, so that by-

comparing the facts obtained at one decade with those of another we can observe many racial changes as they take place.

These more exact inquiries are, however, but slowly accumulating, for man is a long-lived animal, and our impatience is great. We must wait often for many generations, before small, though no doubt important, changes are revealed by our methods of research. For this reason much attention has been given to the race histories of the lower animals, for in their case we may in a few years have many generations under observation, and we can follow out their histories in a comparatively short period of time. We are justified in making use of the facts so obtained and of utilising them cautiously for the interpretation of human race history, for we constantly and in every day life assume points of similarity between man and the lower animals. The blow or the spear thrust which injures us we know will also injure them, and we infer that the contortions which follow their application are symptoms of the pain that we, too, should feel. We know,—and scientific inquiry has vastly extended our knowledge,—that animals have all of them many points of structural similarity, and that their life and race histories are in many ways strikingly like our own. The chief muscles and nerves in man may be recognised in the dog; the main lines of development are in both cases

the same, and the action of food and poison produces results in which there are few points of difference. Of course, when we infer from the facts observable in the study of animal life that similar facts will be observable in human life as well, we have to exercise due caution. It is here that the acumen of a scientific mind is exercised to the fullest degree; we are liable to error, and our results are perhaps tentative, and must be viewed as such, but no one can doubt the suggestiveness and consequent utility of these studies. Just as our knowledge of comparative anatomy and physiology has been essential to a proper understanding of human anatomy and physiology, so the few facts we at present possess concerning human racial development receive significance when examined by the side of a similar but far more extended array of facts drawn from a study of animal racial development.

If, then, it be true that we have before us a small but increasing mass of evidence regarding the laws of racial change, is not this evidence worthy of our closest study? Is it not at least as worthy as the study of the politics of the hour which absorbs so much of our best energies; for what are the petty combinations of parties, or even those temporary associations of individuals, which aim at a common or national policy, by the side of the health and the capacity of that race of which we are but passing

representatives, a race whose future we can make or mar by the course we now pursue?

Evolution.

The belief in our power to modify not only our own but other races is a partial expression of the great fact called "evolution," accepted now by all who have had time and opportunity to examine the structures of living plants and animals placed side by side with the remains of older forms preserved to us in the earth's crust. These structures testify without equivocation to that development of type from type which has gradually led to the present condition of plant and animal life, and which, in view of the changes still observable, we are bound to conclude must still be progressing at the present day.

Modern Philanthropic Effort.

But over and above the fact that racial modifications can and do occur, something is known about the method by means of which these modifications are brought about. Knowledge on this point is so definite, that we are justified in its acceptance, and must take it into consideration in all discussions relating to our racial well-being. Viewed from the side-light thus thrown upon our actions, it will

appear that modern civilisation, with all its care and solicitude for the individual comforts of the race, will be, after all, fatal to our successors, unless we adopt the wise precautions which our present knowledge indicates as essential.

During the last few decades, mankind has learned from Nature many of her secrets, and the knowledge thus obtained has been utilised to free him from those hardships and even diseases which have beset him. This knowledge, and the results of its application, have increased like an avalanche, which adds to itself first by pounds, then by hundredweights, and finally by hundreds of tons. For instance, every climate now contributes to supply us with an infinite variety of foods, to satisfy every necessity and gratify the most dainty palate; and those who lack the power of digestion can be supplied with food artificially digested in the laboratory. The dangers of cold are now minimised by better drainage of the surface soil, by admirable systems of heating, and by the substitution of woollen for cotton underclothing. Excessive toil is prohibited by laws, especially in the case of those occupations in which it is most apt to prove inimical to personal well-being. Education, on the lines most approved by educational departments, is forced by fear of penalty upon the unwilling, and some would even follow the example of certain American states, and make us sober by depriving us

of drink. Even disease is being attacked and driven across the border; the microbe is going the way of the great auk and the dodo, and the probability of human life is on the increase. While the advantages of past civilisation fell to the few, our advantages fall, nay, are forced, upon the many.

Are these conducive to Racial as well as to Individual Well-being?

But those scientific men who have given much attention to the study of life in its widest manifestations in plants, in animals and in man himself, have, with great show of unanimity, come to a conclusion which appears to indicate that, although we may improve an individual during his or her lifetime, both in physical capacity or mental and moral power, this improvement is not transmitted in appreciable degree to their offspring, who have therefore to begin again in their lives just where the parents began in theirs. This teaching strongly indicates that parents cannot pass on to their offspring in any but a most limited degree the improvements they themselves have made in their own physical or mental condition, in the same way that they can bequeath to them the purses they have filled.

If these conclusions, however, are correct, the action of healthy surroundings will never by itself produce a

robust out of a feeble race, nor will the action of the best educational system ever devised develop a race of wise men out of a race of fools. With this non-inheritance of personally-acquired characteristics, the work of individual improvement has to begin again in each generation, for the gained ground is always lost, and racial improvement on these lines must be at best immeasurably slow.

Racial change, improvement, or deterioration, is brought about, so the biologists say, by what is termed selection, that is, by the death or non-productiveness of certain individuals of a race, whereby the others alone remain. If this remnant is organically superior, the next generation inheriting only from them will be themselves organically superior, and racial improvement will be brought about. If this teaching be true, it follows that all our efforts for the good of mankind will be of no avail unless selective agencies are maintained, unless we are prepared to see that each generation of children is the product of the best amongst us in our day. It is quite possible therefore that, even under the present conditions of better hygienic education and moral teaching, the race may be deteriorating, and, indeed, from the biological standpoint, there is every reason to suppose that it is. Our present efforts may therefore be, after all, misplaced, so that it behoves us very carefully to study the whole position. We have first critically to exam-

ine the arguments which point to the non-inheritance of acquired character, to understand the operation of selection, at present considered to be by far the greatest factor in the production of race change, and then to study man in his modern surroundings, with a view to determining how far these are conducive to his ultimate good, and how they may with greatest advantage be modified, with a view to his improvement and advance.

CHAPTER II.

THE STANDPOINT OF BIOLOGISTS.

Lamarck's View on Heredity.

IN this chapter I shall invite attention to what the biologists have discovered concerning racial change, and the conditions under which the change occurs.

Before the simultaneous publication in 1858 by Darwin and Wallace of their "Law of Natural Selection," biologists believed in the Lamarckian view of heredity, a notable follower of Lamarck being our own Herbert Spencer. Lamarck briefly sums up his views in the following passage: "All that nature has caused individuals to acquire or lose through the circumstances to which their race has found itself for a time exposed, and consequently, through the predominant exercise of certain organs, or through a failure to exercise certain parts, it preserves through heredity to the new individuals that are produced by them, provided the changes acquired are common to the two sexes, or to those that have produced these new individuals." Now this view is the one that is popularly held to this day, and it is

the very view which the new school of biologists have set themselves to combat.

Lamarck would have accounted for the long neck of the giraffe by supposing that in remote ages its ancestors were short-necked like other animals, but that it exercised this neck in browsing off high trees, that the necks elongated in consequence of this stretching, and that this elongation was transmitted by heredity, although even by imperceptibly slight degrees, from one generation to another, until the part gradually grew to the present length. Lamarck would cordially have agreed with the modern educationalist in the belief that the children of a man who gives himself to learning will have better head-pieces than if the father had been a soldier or professional cricketer.

In this Lamarckian view of heredity we have two ideas; first, that fresh characters may be acquired during an individual's lifetime, due to the action of his surroundings or environment; and secondly, that these fresh characters are transmitted to the offspring and may produce in time marked racial change. The first idea is undoubtedly and admittedly true. The build of a soldier, a clerk, a ploughman, and an athlete is distinctive; the horn that grows upon a mechanic's hand, and the development of the muscles of a blacksmith's arm, are commonplace facts. It is the second idea, the supposed transmission of these acquired characters, which is now so seriously called in question.

Darwin's Law of Selection.

The law of selection brought forward by Darwin and Wallace may be stated as follows:—No two offspring of the same parents are quite similar to each other, indeed they often vary to a considerable extent. Under the conditions in which they live, some of these offspring will have an advantage over the rest, dependent upon an inborn peculiarity. Inasmuch, therefore, as more progeny are produced than can ever survive, those most fitted to these surroundings will have the better chance of living. These will, in larger numbers, perpetuate the race and transmit their inborn qualities to the race, thus gradually eliminating the less suitable ones.

Keeping to the case of the giraffe, Darwin and Wallace would explain the length of the neck somewhat as follows: With Lamarck they believe that the ancestor was short-necked, but the subsequent elongation they would explain in quite another way. They would take for granted that there are times when grass and foliage are scarce, that short-necked animals would soon exhaust the herbage and shrubs, but that the taller shrubs and trees would afford subsistence to animals with a higher reach. Amongst the ancestral giraffes those born with the longest necks would at such times have an advantage over the rest, who in large numbers would die out. The

longer necked ones, more suited to their environment, would perpetuate their inborn quality of long-neckedness: of the next generation those again with the longest necks would survive, and so on. The Darwin and Wallace school of thinkers would, I quite believe, be prepared to state that by attention to education it would be possible to improve the mental qualities of the race, but they would teach that this improvement could only take place provided that the system made it possible for the clever man and woman to earn a better livelihood, *marry early*, and *have large families*, while the stupid ones should produce fewer children, a condition which at present is far from being the rule.

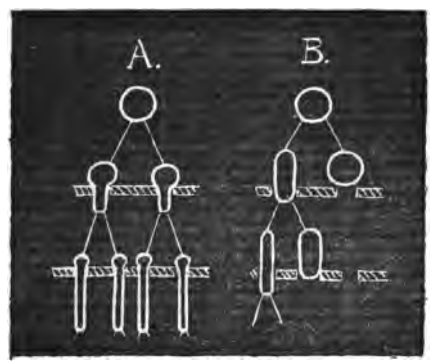

Diagram to illustrate: A, the transmission of acquired characters, B, modification of type by natural selection. In A an individual of rounded proportions, at the top of the diagram, has two children. Environment is represented by a board with holes through which they must pass. In so doing they become thinner, transmit the thinness to their children, and so on. In B, a man of rounded proportions has two sons who vary, one being fat, the other thin. The fat son cannot get through the hole in the board; but the thin one does, has children who again vary, the thin one having an advantage.

Three Ideas involved in Selection.

Now there are three ideas in this law of natural selection: first, that there are inborn variations among the offspring even of the same family; secondly, that these various individuals living in surrounding conditions on the whole uniform and common to all of them, will start in life, some with an advantage and others with a relative disadvantage, and that those possessing an advantage will, more of them, tend to produce offspring; thirdly, that the variations, inborn in this case and not acquired, will probably be transmitted. That there are marked variations—physical, mental, and moral—among a litter of kittens or puppies is within the experience of everyone who has kept them, and that variations in human families are as marked is known to everyone who has brothers and sisters. Even twins frequently differ considerably from each other, and it is said that the last years of the lives of the Siamese twins were sadly marred by their opposing views as to the rights and wrongs of the American Civil War! It stands to reason also that these variations may be of advantage or disadvantage to their possessors, and that among animals and plants, where there are no social props given to the weak, the variations may and do determine survival. To give an idea of the rigorous operation of selection which we find among the lower

animals, we have only to enumerate the number of the progeny produced by each pair, which is often prodigious, and knowing as we do that the number of individuals in a species remain virtually the same in a given district for long periods of time together, we conclude that the room of the parents is just filled by a younger pair, and all the excess of their progeny over and above this one pair must have succumbed to surrounding want and hardship. To give one concrete example out of hundreds that might be selected, let us take the case of the golden eagle given by Weismann in his essay on the "Duration of Life." He says: "Let us fix the duration of life in the golden eagle at sixty years, and its period of immaturity (of which the length is not exactly known) at ten years, and let us assume that it lays two eggs a year, then a pair will produce one hundred eggs in fifty years, and of these only two will develop into adult birds, and thus on an average a pair of eagles will only succeed in bringing a pair of young to maturity once in fifty years; and so far from being an exaggeration, this calculation rather under-estimates the proportion of mortality among the young."

But in all probability most of us are more conversant with the ways of the domesticated cat than with those of the golden eagle. The cat produces its first litter of three or four before it is a year old. Its

kitten-producing life lasts, say, for eight years, and it may, on a low estimate, be supposed to produce a litter of four kittens once in each year. In all a cat will have, on a fair estimate, thirty-two kittens, and may be a great-great-great-great-great-great-grandmother in her lifetime, yet we do not observe in town or village such an alarming increase in the cats from year to year. Their number is pretty stationary, kept so by the enormous destruction of their progeny. The enormous capacity for reproduction of a race of animals, where for a time their surroundings are favourable, will be appreciated by the lowland farmers whose fields were laid waste a few years ago by armies of short-tailed field-mice, whose natural enemies, the hawks, the cats, and the weasels, had been extensively shot or trapped.

The struggle to survive among the savage tribes of man must be excessive. Whole races come and go, and their survivors again fall victims to privations, disease, or natural enemies, before the white man with his better brain and capacity for adaptation.

Selection is a Fact, not a Theory.

The third idea in the law of natural selection—namely, that inborn variations are transmitted—is also a fact that is universally admitted not only among biologists at the present day, but by those

who trust only to their everyday experience. "The child has its father's temper," or "its mother's eyes," are expressions heard in every nursery, while the innumerable cases of the transmission of inborn drooping eyelids and supernumerary fingers and toes show the same thing in a more striking manner.

The law of selection is therefore no mere unproved fancy, it is a statement of fact, and of one which is so obviously true that it is now almost universally admitted, not only among specialists, but by most intelligent and educated persons. It was understood, and its significance partly appreciated by Malthus, and I find that even he acknowledges a prior claim of Franklin's.[1] Romanes[2] tells us that the idea occurred in 1813 to Dr. Wells, and in 1831 to Mr. Patrick Matthew, and the wonder is that other thinkers have passed unnoticed such an obvious phenomenon.

How much is explainable by Selection?

While, however, natural selection as an agent capable of producing racial change is accepted by almost every well-instructed biologist, there are some who are still inclined to give some value to the operation of the Lamarckian transmission of ac-

[1] "Franklin's Miscellany," p. 9.

[2] "Darwin and after Darwin," vol. i., p. 257.

quired characters. They do not deny that to selection is due by far the most obvious racial changes, and that experimentally the most potent factor in the production of a new variety of a plant or animal is selection. They are, however, inclined to believe that along with this, there may be some transmission of acquired character, only discernible after the lapse of many generations. Darwin himself thought that this was the case; he held that certain racial distinctions were due to the action of the environment on the parents and the transmission of the change thus produced upon their offspring. In his great work upon "The Variation of Animals and Plants under Domestication," [1] he enumerates some of these. They may be divided roughly into two classes: first, instincts and habits; and, secondly, results of use and disuse. Darwin believed that the trained habits of dogs and horses, the tameness of the rabbit and other domestic animals, were due to the direct and transmitted effects of man's contact. He held that the large size of the leg and small size of the wing of the domestic as compared with the wild duck are gradually acquired and transmitted by use and disuse.

But Darwin, as Huxley points out,[2] was inclined to lay less stress upon the transmission of acquired

[1] Chapter xxvii., vol. ii., 1875.

[2] "Life and Letters," vol. ii., p. 14.

characters in his later writings; and we find that in the "Origin of Species" he is inclined to abandon them altogether, and accept the position now held by the Neo-Darwinian School of Galton and Weismann. He says (pp. 117, 118), "If under changed conditions of life, a structure, before useful, becomes less useful, its diminution will be favoured, for it will profit the individual not to have its nourishment wasted in building up useless structures. . . . . Thus, I believe, natural selection will tend in the long run to reduce any part of the organism as soon as it becomes through changed habits superfluous."

Just as Darwin himself, as time went on, laid more and more stress upon the importance of selection, and less and less upon the transmission of acquired characters, and naturalists have tended to follow him in the same direction. It may be said, I think, without gainsay, that, since Darwin's death, the most important and outstanding work done by the biologists has been the uprooting of much of the Lamarckian doctrine, originally held, not without question, however, by Darwin himself. The biologist of to-day is more Darwinian than Darwin, and explains on the Darwinian hypothesis even those cases which had presented difficulties to Darwin's own mind.

Galton and Weismann.

Amongst those who were pioneers are Galton and Weismann, and, curiously enough, in England and Germany these two men, independently of each other, came to the same conclusion respecting the non-inheritance of acquired qualities, and pointed out that the facts of development indicate that the generative matter is passed on from one generation to another, remaining intact in the body of the parent, and that we have no reason to suppose that it could be influenced by changes in other parts of the parental organism. It is not uninteresting to note and contrast in these two investigators the action of the typically English and typically German mind, more especially as the comparison is perhaps equally complimentary to the two nationalities, and indicates the value of results arrived at by workers of different individualities.

Galton was first in the field, and as long ago as 1876[1] made the following clear and concise statement:—"The conclusion to be drawn from the foregoing arguments is that we might almost reserve our belief that the structural cells can react on the sexual elements at all, and we may be confident that at most they do so in a very faint degree: in other words,

[1] "Journal of the Anthropological Institute," vol. v., pp. 344-7.

that acquired modifications are barely, if at all, inherited in the correct sense of the term." Thirteen years later[1] he expresses himself in practically the same terms. An untiring investigator, chiefly in the facts of human heredity, he briefly sums up as above one of his most important general conclusions. It is all he has to say, it is all that his facts permit him to say.

In 1882, Weismann[2] questioned whether there is as yet any proof that acquired characters are transmitted; he writes :—"The theoretical conception of variation as a reaction of the organism to external influences has also not yet been experimentally shown to be correct. Our experiments are still too coarse, as compared with the fine distinctions which separate one individual from another, and the difficulty of obtaining clear results is greatly increased by the circumstance that a portion of the individual difference always depends upon heredity, so that it is frequently not only difficult, but absolutely impossible, to separate those which are inherited from those which are acquired."

Since that time, Weismann, in a series of important essays,[3] indicating a profound knowledge not only of

[1] "Natural Inheritance" (1889), p. 14.

[2] "Studies in the Theory of Descent," translated by Raphael Meldola, p. 692.

[3] "Essays upon Heredity," translated by Poulton, Schönland and Shipley ; vol. i. published in 1889, vol. ii. in 1892.

comparative morphology, but of the habits and modes of life of a vast number of animals and plants, has shown that many of the cases which Darwin was doubtful about may reasonably be explained by selection, and he has marshalled a vast mass of evidence in support of the argument that acquired characters, experimentally produced, are not transmitted.

These essays are profoundly interesting, and will supply food for thought for many years, but it must be admitted that Weismann has gradually been led away to speculations of the most elaborate kind, built upon the most flimsy substratum of fact. There is evidence of this tendency even in his early writings, but in his later essays, especially his recent work on "The Germ Plasm: a Theory of Heredity,"[1] the speculative part quite overpowers the rest.

As those who are interested in heredity will probably read his works with the greatest attention, I have ventured in an appendix to make clear what in his works may, in my opinion, safely be looked upon as speculative rather than legitimate, or even provisional, generalisation, and what, therefore, may be altogether omitted from the study of a practical problem such as that with which we are concerned.

[1] Translated by W. Newton Parker (1893).

Are Acquired Characters transmitted?

The practical issues which both Galton and Weismann have raised cannot, however, be underestimated, and, in respect to the non-inheritance of acquired characters, the mass of modern thinkers may already be said to have given their allegiance to the views of those two thinkers.

But we are living in times when mere authority is at a discount, and we may well demand the facts for ourselves. The point which we are inclined to question is one as to which a doubt was often present in Darwin's mind. Granted that selection is a factor, we are inclined to believe that the transmission of acquired characters must also take place, at any rate, to some extent. In attempting to decide this question upon the facts themselves we may take two lines of research. In the first place, we may examine every case of racial change, the production of new or different parts, the development of a new instinct, or the degeneration or loss of parts or instincts present at some past epoch. If in every case we are not compelled to exclude natural selection, and if in every case that we can directly and experimentally follow, selection is the outstanding factor, then there is strong presumptive evidence that racial change is caused by selection and not by the inheritance of acquired characters. In the second place, we may

artificially induce the acquisition of some character, and notice whether this is transmitted; if it is not, then the general operation of this kind of transmission is rendered very doubtful.

Many Cases of Supposed Transmission to be explained by Selection.

It is upon these two lines that Galton and Weismann worked, and we may now follow in rough outline the evidence they adduced. Darwin had been able to explain, to universal satisfaction, the evolution of many types and varieties, as a result of selection alone; though certain cases of the supposed inheritance of use and disuse, and of acquired instincts, caused at times doubts to arise in his mind. But Weismann has questioned this inheritance, and has shown that —as Darwin himself sometimes believed—these may readily be explained by selection alone. The gradual increase, generation after generation, in the size of a useful limb or the perfection of a valuable organ of sense may readily be explained by selection. The fact that the limb or organ is of use to the race in its struggle will determine the survival of those born with these serviceable parts well-formed, and these in their turn will produce others as favourably or more favourably constituted, from whom further selection can take place. We cannot shut our eyes to the

operation of selection in such instances, nor have we any reason for saying that part of the effect must be due to some other cause. In the case of organs which become useless and finally disappear in the course of generations, a selective agency will sufficiently account for this disappearance. As Darwin himself pointed out, a useless organ is an expense and a drain upon an animal's capital; it requires blood, and its exercise uses up some of the sum total of energy the animal possesses. The truth of this can be shown experimentally, as when compensatory growth occurs in the rest of the body after amputation of a limb, or when one lung or kidney enlarges subsequently to the disease or removal of the other. In cases where an organ is useless, those who have it badly developed, and in consequence have other and useful parts more fully formed, will have a distinct advantage over those born with a well-formed but useless organ. We may thus explain the small size of the wings of the tame as compared with the wild duck, an instance in which Darwin saw difficulty in excluding inherited disuse. In this way we may explain the occurrence of the still smaller wings of the running ostrich and apteryx; also the blind fish of the Kentucky Cave, and the visionless eyes of the burrowing mole. As an illustration, an animal or man may, in this respect, be compared to an individual with a given amount of capital, who,

if he spends his money in one direction, will thereby have less for another purpose. In this way a big leg may be obtained at the expense of a small arm, or a good ear be the cause of an indifferent eye.

When we turn to the question of the supposed transmission of acquired instincts and habits, we find that it is possible by means of the principle of selection, to explain some, at least, of the cases which presented difficulties to Darwin's mind. Thus the tameness of rabbits, cats, and dogs, which animals have for countless generations been subjected to domestication, need not necessarily be accounted for by supposing that the results of training are transmitted. For it is easy to understand how those that would have rebelled most against man's authority, and who were by nature the least tractable, would have been less cared for by man, and probably would finally have suffered extermination, while the docile received his attention, and were allowed to reach maturity and perpetuate the race. That this selection must be going on at the present time is very obvious, and as instances we may note the savage dogs that are constantly being destroyed, and the house dogs and domestic pets that are, in most cases, continually being selected from the docile animals and those of good temper. A dog that does not possess these good qualities can have no existence in town or village, and so by continual

extermination of the unfriendly, the "friend of man" has gradually been evolved.

Paucity of Experimental Evidence of such Transmission.

Turning now to those cases in which characters can be acquired or experimentally stamped upon an individual, we find that no single reliable instance can be adduced in which transmission takes place. Mutilations have been practised upon male infants by Jews and other Semitic races for thousands of years; yet, in spite of this, the operation has still to be performed, for the lost parts appear in the offspring of to-day as in the earlier periods of their race's history. Certain breeds of dogs and sheep have for many generations been systematically docked, and yet the young are born with as long tails as those of other breeds. Chinese women have compressed their feet from times long past in their history, yet Chinese female infants are still born with large feet, and have to undergo afresh the torture of their compression. More curious still, for it affects an organ of paramount importance, the brain, there is a tribe of Indians who flatten their heads in early life, entirely changing the shape not only of the skull, but of the brain itself, yet their children are born with normal rounded heads; the induced change is not transmitted.

It must be admitted that this evidence is pretty strong, and we need not wonder that it has produced such widespread conviction, although it has been so lately taken up by the thinking public.

The Reproductive and the Body Cells.

The body of a plant or animal is composed of small living bodies, most of them of microscopic size, called cells. These lead, to a certain extent, individual lives, and have individual characters, but they are built, as it were, together, like the bricks and stones of a house, to form the body. The cells are, all of them, nourished by the blood and lymph, and some are connected together by strands of connecting matter termed nerves. All the cells of the body are descendants from a single fertilised egg, which has resulted from the fusion of a paternal and maternal sexual cell. Among the cells of the body, and situated in special organs, are the sexual cells, likewise nourished by blood, but not connected by nerves with other parts of the body.

Reproductive Cells unaffected by Local Changes in the Body Cells.

Now there is no reason to suppose that these sexual cells residing in the bodies of the parent will

be influenced by a change in the muscle or brain cells of the parent unless this change in some way or another influences the blood, the common go-between. But the blood is now known to be but a food and oxygen carrier, and an eliminator of used-up products. It is like a river laden with vessels carrying corn for the food of the big city, and nothing more. The life, the energy, the character of the body is the sum of the lives, the energies, and the characters of the cells—although these necessarily require the nourishment derived from healthy blood—just as the life of the city is the sum of the life of its citizens, who require the nourishment of the corn.

Constitutional Change may, though it rarely does, affect the Reproductive Cell.

Let us suppose that an average healthy man during his lifetime acquires, by use, accident, or disease, some change in his right arm. There is no reason to suppose that the sexual cells, rather than any other cells in the body, will be affected. If, on the other hand, this local change in the arm affects the blood, depriving it of nutritive power, or casting into it obnoxious matter, then it is possible that all the cells of the body may be affected. We have many instances of such a thing, as when the blood and whole constitution are involved after maybe a primary local

affection, and when, in consequence, the hair drops off, or marks and irregularities of the nails appear. In these cases the sexual cells may suffer from want of nourishment, or from what we may term a poison, and may produce less vigorous and perhaps diseased or malformed offspring, but they will show no tendency to develop in the offspring that primary local affection which caused ailment in the parent. But, as we shall see in the next chapter, the sexual cells in most cases get off scot-free, and the most dangerous acquired constitutional diseases leave no trace of their passage upon the reproductive elements. It is indeed difficult to point to a case, with the notable exception of syphilis, in which acquired constitutional blood disorders leave any trace in the organisation of the progeny, and we are indeed fortunate that this is so.

There seems to be some evidence that we may stunt the growth of a plant or animal by insufficient or unsuitable food, and that all the cells of the body may thereby be reduced in size, the sexual cells among the rest, and that these reduced cells give rise to small progeny in the next generation. Here again the evidence in the case of animals seems rather doubtful, and rests on a few statements, such as that of De Quatrefages, that horses taken from Normandy to the hilly and less fertile country in Brittany become distinctly smaller in the course of three generations.

In our own country large horses are found in the plains and small horses and ponies in the hilly districts of Wales and Scotland. But the obvious utility to man of small breeds in hilly districts, and of heavily-built horses on the plains, and the fact that horses have been bred for hundreds of years in view of their services to man, throws great doubt upon this particular evidence of De Quatrefages', and we may well leave it out of account, unaccompanied as it is with evidence as to the total exclusion of the interbreeding of the Normandy with the Brittany variety.

On the other hand, among plants it really appears as if by adjusting the soil and climate you may produce stunted varieties, whose seed produce small plants. The poor and exposed ground of our hilltops are covered with dwarfed varieties of the bigger plants growing luxuriously in the adjacent plains, and a classical case mentioned by Lemaire[1] is that of the hemp which, removed from Piedmont to the less suitable soil of France, becomes a smaller variety, growing to only half its former height in the course of two or three generations. The enormous dwarfing that one can subject a plant to is illustrated in the case of the conifer, which the Japanese can cause to remain the size of a tiny shrub during its hundred years' growth, by simply keeping the soil at the starvation edge, and by pruning the branches and roots.

[1] D'Orbigny's "Dictionary

It appears then to be pretty certain that every man and woman possesses a store of sexual cells, derived directly from the original sexual cells from which he or she was developed. These in the main are like the original cell, being as they are of its substance, but they show minor differences amongst themselves, and give rise in their turn to offspring no two of which are alike. These sexual cells, residing within the paternal or maternal body, are uninfluenced by the course of life led by that body, except, perhaps, in some few cases in which the whole system and the blood are impoverished, saturated with alcohol, or infected with the microbes of disease, which microbes in some cases, perhaps, directly attack the sexual cells.

The Facts of Evolutive Selection known to the Gardener and Breeder.

Scientific men are often very slow at arriving at a truth, and there are many instances of valuable knowledge held by sections of the people in perhaps an empirical fashion, which has at last found acceptance by the learned. The practical results of all this biological teaching has been in the hands of cattle-breeders and nurserymen for centuries. The various breeds of cattle have been produced by man, not by any new method of ventilating the cow-sheds, or by

some freshly discovered patent fodder, but simply by selecting for breeding purposes those individuals that most suited the breeder's purpose. The racing stallion was kept which most resembled a greyhound, the hog that most resembled a beer barrel, and the cow that gave the best combination of milk and flesh. The gardener produces the hundreds of new varieties placed every year in the market by keeping the seeds and propagating from any variety he may wish to perpetuate, and these varieties are always spontaneously occurring. He perfects his stock by selecting the seed only from the very best.

The testimony not only of the learned but of those who in their lives, unbiassed by any theory, have been engaged in modifying breeds of animals and plants, is unanimously in favour of the view that selection is the only, or, at any rate, by far the most powerful factor in producing racial change. So far these facts have had little or no application to the question of human race progress. People are still too much biassed by archaic anthropocentric ideas; they view man by himself, under his own special laws, and would often be shocked by an attempt to draw obvious parallels between him and the lower animals. Amongst the thinking few this attitude has changed, and broader and sounder views are rapidly gaining ground.

People, too, are apt to feel what may be called a

false delicacy in speaking of questions relating to race change, but this may more rightly be termed the shyness necessarily associated with an unusual topic of discussion. We English laugh at the American woman who, from notions of extreme modesty, will not speak of the "leg" of a piano; but we in our turn draw our own often exaggerated lines, beyond which we will not pass. Just as there is no subject which will not yield food for the evil-minded, so there is no subject—having to do with the laws of nature—which cannot be naturally approached in all simple-mindedness. As soon, therefore, as it is realised, that this question we are dealing with is one which demands not only our closest attention, but also the advantage of public and private discussion, so soon shall we have acquired the habit of regarding it in quite a matter-of-fact and pure-minded way.

CHAPTER III.

CAUSES AND SIGNS OF PHYSICAL DETERIORATION.

Modern Care for the Individual.

IN the last chapter we saw that while selection is an evident and powerful factor in the production of racial change, there is but slight and in many cases questionable evidence that acquired characters are ever transmitted. During their lifetime a man or woman may be subject to the most varied conditions, and yet the quality of his or her offspring will not be affected by these conditions except in cases where impoverishment or poisoning of the blood has ensued, thereby enfeebling his or her reproductive cells. These facts have not been gained by a study of the lower animals alone, for most researchers have kept man in view, while others, like Malthus and Galton, have confined their observations almost exclusively to the human kind. In this chapter we shall see how these generalisations are borne out by the study of disease, and we shall see what effect the modern methods for the treatment of the sickly and feeble are having

upon the race. We moderns as individuals have many advantages over those who have gone before us; we owe to the untiring energy of our ancestors the facilities for travel, the pleasures of accumulated music and literature, etc., but among these hundreds of advantages we possess none are more marked than those we owe to the scientific followers of the profession of medicine, the application of whose learning gives in our day to the less robust a possibility of life and happiness they never had before.

Preventive Medicine.

The words "mederi," to heal, "medicus," the healer, and "medicina," the remedy, indicate pretty clearly the almost superstitious feeling current in early times regarding the attributes of the medical man; but physicians have in more recent years begun to doubt in some measure of their power to cure disease when once established. With increased knowledge, and with growth of professional acumen, the limits of this power are more clearly seen, and the solution of a metallic salt, or decoction of a herb is now withheld when at one time it would have been administered with the fullest confidence. With this healthy scepticism as to their power to cure has come very certain and exact knowledge of how to prevent, and preventive medicine has recently exercised an

influence upon disease and upon mortality which is unique in the history of humanity. But while the benefit of our changed and more healthy surroundings are to the advantage of us all individually, we shall have to consider whether as a people we shall in the long run be the better for this change, or, on the other hand, whether in obtaining this individual advantage we are not imperilling the vigour of the race.

Micro-organisms of Diseases and their Extermination.

Nowhere has preventive medicine achieved greater triumph than in the extermination of certain micro-organisms which gain access to the body and cause the febrile class of diseases, such as small-pox, measles, typhoid fever, and very many others. At present none of these micro-organisms can be said to be extinct, but they have in some cases been banished to distant parts of the globe, and in other cases the conditions suitable to their existence, and the means of their propagation are so well understood that their banishment is being systematically and successfully carried out, so much so that a disease such as small-pox, which at one time headed the list of fatal diseases, does not come in the category of anxieties of the mother of to-day; and pyæmia and puerperal fever, which twenty years ago were at times

dreaded scourgers in most hospitals, now occur only from culpable and punishable neglect.

The Reproductive Cells are as a Rule unaffected by them.

A short study of these diseases should well repay us, showing as it will do that in by far the greater number of cases these severe constitutional derangements produce no effect upon the reproductive cells; that they are in fact incapable of producing a change that will be hereditarily transmitted. We shall learn, moreover, the part that they have played, and can play, in producing racial change by selection. The micro-organisms of disease are of many varieties, and each variety is capable of setting up its own peculiar disturbance. The disturbance set up by one kind we call small-pox, that arising from another kind, cholera, and so on. Now, the very curious point comes out that in most of these diseases, although the composition of the blood is profoundly altered, and many of the tissues undergo marked change, this change, fortunately for us, is quite of a temporary character, and when the attack is over there is only one test which will enable us to say that the body is not just in the same condition as it was before. This test is that it cannot be infected again for a long time, if at all, by the same micro-organism.

This induced immunity from further attacks has

received in the hands of Metschnikoff a curious and very interesting explanation. He has shown that an army of small cells, called phagocytes, which wander through the blood and tissues, are able to attack the microbes of disease, and that after a struggle they are able in many cases to kill these voracious invaders. In so doing, however, the weaker phagocytes succumb to the struggle, while those which are left alive within the body of the convalescent patient possess the power of resisting and destroying the particular microbe which had undertaken the invasion. These resisting phagocytes, selected from the rest, together with their descendants, who share their resisting qualities, are able to prevent fresh inroads of the same enemy. We need not, therefore, assume that this acquired immunity, the sole relic of the attack, indicates any change in the ordinary muscle or brain cells of the body, or that the reproductive cells are in any way altered, for the immunity is due only to a change in the phagocytic army.

The germ cells in almost every case get off scot-free, and there is nothing in the organisation of a child to indicate whether or not his father or mother suffered from measles, or scarlet fever. It might at first sight be urged, in opposition to this fact, that, although we cannot recognise the child of a man who suffered from measles or scarlet fever by any visible sign, yet the child is in some way different, inasmuch

as he is to some extent immune to those diseases. In favour of this belief, the many instances in which a fever has been brought to a country never before accessible to the germ (for instance, the introduction of measles and small-pox to newly discovered America, where fearful ravages were caused thereby), may be brought up as evidence to prove that those habitually living among the germs must have become immune and have transmitted this immunity to their progeny. Again, the black population of Sierra Leone have only a mortality of ·24 per cent. from malaria, while the mortality of the white settlers is 47 per cent.;[1] and, in this case, it may be urged that the black race has become by transmission of immunity partially immune. But these cases which appear to be examples of transmitted immunity may receive another, and a much more simple, explanation. No two children of the same parents are alike in colour of hair, shape of limb, temperament, etc., and they also differ widely in their capacity to receive and combat infection. An epidemic of fever, therefore, will always select to kill those organically most liable to fall a prey to it, while the remnant, having by nature greater power of resistance, not only survive, but may also be calculated upon to produce progeny, on the whole, as resistant as they are themselves.

[1] Billing's "Text-book of the Theory and Practice of Medicine," p. 8.

Man has been selected by the Action of the Microbes of Fever.

Races, therefore, subject to epidemics of a particular fever, suffer selections in the hands of the microbe of that particular fever, and those living are survivals cast in the most resisting mould. It may not be flattering to our national vanity to look upon Englishmen as the product of the selection of the micro-organisms of measles, scarlet fever, small-pox, etc., but the reasonableness of the conclusion seems to be forced upon us when we consider his immunity from these diseases as compared with that of natives of the interior of Africa, or of the wilds of America, whose races have never been so selected, and who, when attacked for the first time by these diseases, are ravaged almost to extermination. We find, then, that an ordinary attack of measles, scarlet fever, whooping cough, erysipelas typhoid, or typhus fever, when it has passed away, leaves the tissues of the body in as sound and healthy a condition as before; and, indeed, were it not for this fact, the human race could hardly have existed at all, continually exposed as it has been, for countless ages, to the aggressions of these microbes. By exterminating these diseases, we shall, no doubt, preserve countless lives to the community, who will in their turn become race producers, but, inasmuch as the individuals thus preserved will in

many cases belong to the feebler and less resisting of the community, the race will not become more robust. In fact, it is probable that, as a race, we shall thereby suffer, for the banishment of the disease will enable the feebler members of the community to live, and in larger proportion contribute to the progeny of the future. That this is actually the case will shortly be pointed out.

Leprosy an Exterminator of the Unhealthy.

But there are other microbes which, in addition to the production of blood changes, have a profound and lasting effect upon many of the tissues of the body. Such are the microbes of leprosy and syphilis.

The terrible ravages that the microbe of leprosy is capable of effecting are appreciated only by those who in Norway or elsewhere have visited those death-houses now fortunately to be found in but one or two parts of Europe. Yet, even in this case, strange to say, the germ cells do not seem to be reached by this loathsome disease, and it is not transmitted from parent to child.[1] A disease of mediæval, not of modern, Europe, we need not discuss its action on racial change more than to say that, hideous as are its aspects, it must be looked upon as a friend to humanity; for, while the microbe of typhoid fever will attack

[1] Report of Leprosy Commission in India, 1890-1.

a man who is healthy and living in healthy surroundings—excepting for the microbe that lurks in his well—the microbe of leprosy feeds upon those who are debilitated from conditions under which healthy and strong racial development is impossible. It is a depopulator of starved, ill-nourished districts, and the race recruits to its advantage from those more favourably placed.

In the case of syphilis, serious and often permanent tissue change is produced as a result of the action of the microbe, and in this disease, to an absolute certainty, an effect may be produced upon the offspring. Many suppose that this is due to the transmission of the specific microbe itself from the body of one or both of the parents to the developing egg. That such a thing is not impossible is shown in the case of silk-worm disease, in which the spores are to be found within the egg of the silk-worm moth. These spores subsequently develop and attack the tissues of the grub of the next generation. In syphilis the same kind of thing no doubt occurs; for a syphilitic child may subsequently infect the mother or nurse during the period of suckling. But there are other cases in this disease which appear hardly to be explained so easily, and we have to assume that the germinal cells are themselves changed in some way during their sojourn in the parental body, for after a certain time the disease is no longer capable of trans-

mission by the parent, and the children born after this period, though themselves diseased, are incapable of infecting those who tend them. We have every reason to believe, therefore, that there are no specific germs or microbes left in the body of the parent, and that we have to do solely with the more or less permanent change in the reproductive cells, produced by the microbes during their residence in the body of the parent. The children born during this period are frequently ill-nourished, possess recognisable indications of disease, and are subject to nervous and other affections.

We have here, therefore, for the first time, distinct evidence that an obviously acquired constitutional disease is transmitted, and that that transmission is in some cases due to a direct effect of the action of the microbe upon the germinal cells. The microbe of syphilis, unlike the microbe of leprosy, but like that of measles, feeds on healthy blood and tissue. It attacks the strong as well as the weak, and, if the weak more readily succumb, yet the strong and vigorous are more apt to acquire it. It is not, therefore, selective, like leprosy, and this fact, added to that of its capacity of transmission, ranks it as a disease distinctly inimical to race progress.

Germs of Phthisis and Scrofula, our Racial Friends.

During recent years it has been discovered that the symptoms of phthisis and scrofula are due to a microbe, the tubercle bacillus. It appears, however, that this bacillus cannot gain access to, or multiply in, the tissues of a healthy and vigorous man or woman; most of us probably have often carried this micro-organism within the mouth or stomach, and though our gastric juice has not been able to destroy it, as is the case with so many of our invisible foes, it has been unable to pass into our blood or lacteals. Dr. Woodhead puts this fact strongly.[1] He says: "A perfectly healthy individual, placed under favourable conditions as regards food, fresh air, and exercise, is never attacked successfully by tubercle bacilli, the active, vigorous tissue cells being perfectly able to destroy any bacilli that make their way into the lungs, the pharynx, or the intestine."

It appears, too, that a certain type of individual is readily attacked by this microbe, while the normal individual, debilitated though he may be by unfavourable external conditions, falls far less readily a victim. As Professor Lauder Brunton[2] remarks: "We are constantly meeting with persons belonging

[1] "Bacteria and other Products," p. 230.

[2] "Introduction to Modern Therapeutics" (1892), p. 15.

to very consumptive families who escape the disease by living under conditions where the bacillus tuberculosus is likely to be absent. On the other hand, persons such as nurses are in all probability frequently inhaling the microbe, and yet are not attacked by the disease. In the first case immunity is probably due to the absence of the seed, notwithstanding the favourable condition of the soil; in the second it is due to the barrenness of the soil, notwithstanding the presence of the seed."

Inasmuch as phthisis is markedly hereditary, we may look upon the *type*, not the disease, as being transmitted. A phthisical type of person is one who comes of a family liable to fall a prey to this microbe, and he is recognisable by many distinctive characteristics of hair and complexion, and by qualities of temperament, feature, and figure.

Sufferers from phthisis are prone to other diseases, such as pulmonary and bronchial attacks, so that over and above the vulnerability to this one form of microbe they are to be looked upon as unsuited not only for the battle of life, but especially for parentage and for the multiplication of the conditions from which they themselves suffer.

The phthisical are attractive in personal appearance on account of their rich skin and hair colouring and their frequent brightness and vivacity, and their obvious delicacy also elicits a feeling of pity and

wish to protect them. In consequence of this they easily marry, and they are as a rule very fertile. Galton [1] says: "There is fair doubt whether a group of young persons destined to die of consumption contribute considerably less to the future population than an equally large group who are destined to die of other diseases." Now this phthisical type is very common with us indeed, and it appears to be an innate variation to which our race is liable. It is evident, therefore, that those people with the tuberculous variation who, even under the present circumstances, manage to contribute their quota to the population, would, were the bacillus tuberculosus altogether exterminated, contribute more than their share, and the type would become more common. And let it be remembered that this type, apart from the action of the bacillus, is a delicate and fragile one and liable to other affections, and the effect of giving the type any advantage in the struggle for life would surely imperil the well-being of the future of the race. When, some years ago, it was thought that a cure for phthisis had at last been obtained, great tribute was naturally and rightly paid to its discoverer; but had this cure proved as efficient as the more sanguine were led to expect, it would be terrible to contemplate the eventual suffering that would have resulted from the constantly increasing

[1] "Natural Inheritance," p. 182.

numbers of the phthisical type that would have been born with each generation.

If we stamp out Infectious Diseases we perpetuate Poor Types.

It is a hard saying, but none the less a true one, that the bacillus tuberculosus is a friend of the race, for it attacks no healthy man or woman, but only the feeble. It is like the bacillus of leprosy in this respect, but in this respect only, for leprosy attacks anyone living under certain unhygienic conditions. Remove these conditions—as we have done long ago—and the bacillus of leprosy disappears; its duties are over, like those of the extinct plants and fishes in the rocks.

The tubercle bacillus on the other hand attacks a type to be found not only in the poor, ill-fed, and ill-conditioned, but also those who live well. It is a disease of all classes, and those who live in well-ventilated rooms, and who conform to every sanitary regulation, may still belong to the type who fall a prey to it. It is certain, therefore, that, improve the external conditions of life how you will, this type will remain. It is also as certain that by giving the type a better chance than it has already, by preventing infection or by delaying the disease, the type will be more and more prevalent as each generation comes to life.

It comes out pretty clearly from our short study of the infective diseases that some of the microbes that cause these, such as the bacillus of tubercle, only feed on unhealthy human tissue, while the greater number of them kill, if anything, the weak rather than the strong. They are, therefore, on the whole, and as a natural consequence, our race friends rather than our foes, and if we attempt seriously to do away with their selective influence—*viz.*, the elimination of the weak and the preservation of the strong—we must supply this selective influence by one equally potent, or the race will tend to deteriorate. What can be done in the future, and what it is expedient for us to do at the present time, will be more fully discussed in a subsequent chapter; but I may state at once that *pari passu* with our endeavour to prevent these diseases must be our efforts to enlist the co-operation of the human charity that would avert suffering in such selection as shall necessitate the birth of future generations from the healthiest and best of those amongst us. As selection is the race-changer, we must replace the selection of the microbe by the selection of human forethought.

A large number of diseases, due probably to some innate family predispositions, are known to us. Of these diabetes, hæmophilia, and some others are of comparative rarity, and may be left on one side in

this necessarily contracted sketch. Others, such as cancer and constitutional weakness of the respiratory and other organs, as well as insanity, are frequent enough to merit our close attention. Of cancer we at present know too little, and I propose to leave it on one side. Of inherited weakness of special systems we have many examples, such as a delicate respiratory or digestive mucous membrane, inherited variations in the mechanism of assimilation, and also gout and obesity—in fact, innate delicacy of all kinds, which renders their possessor less able to cope with his natural surroundings, let these be what they may.

There is hardly a family that can boast of the complete want of hereditary weakness, and among the children of particular families, where these weaknesses exist, some show the taint more than others. In times of hardship, cold, exposure, coarse food, etc., these weaker ones perish, and the race is consequently propagated from the stronger ones. Within certain limits cold, exposure and coarse food are compatible with great physical excellence, for the cold and exposure, hurtful to the sickly, braces and hardens the more robust, and coarse but nutritive food supplies him with energy and strengthens the powers of digestion. The finest races have been bred by hardship. It is proverbial to speak of "the hardy mountaineer," and one cannot look at a lowland Scot without feeling that his stock had, in days

gone by and for many centuries, run the gauntlet of oatmeal porridge and cold east wind.

But we are rapidly diminishing those selective agencies which in the past have developed race vigour. As we shall presently see, skill in nurturing the sickly has, in modern times, wonderfully reduced the mortality amongst infants; improvements in methods of nursing, the replacement of cotton by flannel and wool, and the use of many foods, some of them artificially digested, gives a sickly infant a chance of living, and it survives its first most dangerous years. Then its chances are again improved, for the infective diseases are being held in check, and it has comparatively little to fear from them. Thus it survives and lives to adult age, when, like the hothouse plant, it is still protected from hardships to which the race had formerly been freely exposed. It lives to lower the average physique of the mothers or fathers who produce the next generation of children.

This increased preservation of the sickly has had the effect of increasing the life period of an average child, and this increase in the life probability is often and very rightly cited as an indication of the improved sanitary conditions of the people. Improved sanitary surroundings, as we have seen, are taken advantage of chiefly by the sickly, and thus with our increased probability of life we have diminished

the average robustness of constitution, or innate healthiness of the race, for a larger proportion of sickly ones are living amongst us. In our day a greater number of parents suffer from phthisical, scrofulous and other taints than in days gone by, and these and other taints are passed on to their children.

So far we have seen what of necessity follows from our biological premises, but it is also possible, I think, to show by statistics that already very observable deterioration has taken place.

Births, Deaths, and Marriages.

If we examine one of the reports of the Registrar General for births, deaths and marriages, we shall gain pretty full information concerning the deaths from disease, accident, old age, etc., that have occurred during the last thirty or forty years.

Increase of Constitutional Weakness.

In Report 54, Table 17, the annual death-rates from various causes per million of population are given, and arranged in groups of five years from 1858 to 1890. We have there a history of thirty years, and even in that time a notable change in this

history is to be observed. I have arranged the greater number of facts given in Table 17 in the following table, so as best to bring out those points which we are discussing. In the first group of disease are those due to micro-organisms, and a diminution of diseases to a very marked extent is to be observed of late years. Phthisis and scrofula placed by themselves in this group share in this decrease. In the second group are diseases that are due in great measure to carelessness, want of management, neglect and ignorance, such as convulsions, diseases of dentition, parturition and registered accidents. These, too, as one would expect, diminish yearly in a country where surrounding comforts and a sense of responsibility are on the increase. When we turn to the third group, that of constitutional disease, where the hereditary tendency comes in, we find an increase in almost all the hereditary diseases. A tendency to an increase of neurotic affections is shown by an increase in the deaths from nervous diseases, suicide and intemperance. A large increase in the diseases of the respiratory system is due in part to the increasing number of tuberculous patients who, kept from inroads of microbes, nevertheless readily fall a prey to other affections: there is, too, an increase in diseases of the circulatory system, in cancer, diabetes and other constitutional diseases.

Annual death-rates in England from various causes, per million persons living, in groups of years 1858-1890—

CAUSE OF DEATH.	1858-60.	1861-65.	1866-70.	1871-75.	1876-80.	1881-85.	1886-90.
GROUP I.							
Phthisis and scrofula	3304·0	3311·0	3300·2	2940·6	2816·8	2540·8	2322·2
Other diseases of micro-organisms[1]	4403·9	4498·6	4677·2	4055·8	3233·6	2708·8	2417·0
GROUP II.							
Diseases of dentition, parturition, convulsions, accident and negligence	2257·0	2262·0	2191·0	2077·2	1860·4	1678·6	1538·0
GROUP III.							
Some constitutional diseases[2] . . .	6056·3	6311·4	6594·6	7199	7636·4	7531·2	7929·4

This table demonstrates, therefore, in a most marked manner, the action of modern civilisation and of preventive medicine, which, by removing the microbe and diminishing the dangers of child-rearing, has diminished the rate of mortality to a very notable extent in the early years of life. The increase in the number of deaths from constitutional diseases, occurring as they do in middle or advanced age, are probably due to the survival of an increased number

[1] These include small-pox, measles, scarlet fever, simple and ill defined fever, whooping cough, diphtheria, miasmatic diseases, cholera, diarrhœa, dysentery, erysipelas, puerperal fever and thrush.

[2] Diseases of the nervous, circulatory and respiratory systems, cancer, diabetes and other constitutional diseases.

of individuals into the period of maturity. From this table it is difficult to say whether or no these individuals are below the mean average type. We have to die at one period of life or at another, and if men and women are preserved from the dangers of childhood and youth, there will be more to fall victims to the lung and chest complaints of more advanced life.

But it is possible by other sets of figures, obtainable from the Registrar General's reports, to arrive at some sort of decision as to the healthiness of the middle-aged and elderly people living to-day, and to compare these results with similar ones drawn from the statistics of twenty or thirty years ago.

Death-rate for Advanced Years on the Increase.

In table 13 (Report of the Registrar General for 1891) the death-rates per 1,000 are given for different age periods, and these results date from 1841 to 1890, and are arranged in groups of ten years.

The table was prepared in the following way. At each period given, say from 1841-50, the number of persons living at a certain age was calculated from the census returns. The numbers dying at that age being known, these are given in the table per 1,000 persons of that age. In order to reduce the number of figures, I have shown the death-rates of two

groups only, the first group of persons (males) younger, and the second group of persons older than 35 years.

DEATH-RATE OF MALES PER 1000 LIVING.

	GROUP I. 0-35 years.	GROUP II. 35 and upwards.
1841-50	112·0	591·0
1851-60	111·2	581·9
1861-70	110·8	595·1
1871-80	101·0	616·7
1881-90	87·8	589·3

Group I. shows the very steady diminution in the death-rate of the earlier years of life, and similar results are also brought out by a corresponding table showing the death-rates among females.

Group II. showing the death-rates of individuals above 35 years of age, at first sight seems to give no very satisfactory predications of either increase or decrease of mortality, indeed the last period indicates a very decided fall in the mortality. We have, however, to remember that climatic influences are variable, and that certain groups of years are especially healthy and others inimical to well-being. That the last period is a very healthy one is indicated by the excessive fall seen in Group I., and by a corresponding fall in the number of deaths of females. These climatic variations may be assumed to influence the numbers of Group II. more than those of Group I.; indeed, on reference to the details given in

the full report, I see that the fall in that period is in large measure due to the decreased mortality of those over 75, a time of life very susceptible to climatic influences.

On the whole, Group II. indicates that the death-rate above 35 is increasing, for if we add together any two consecutive periods, say 1841-50 and 1851-60, we shall find that the mortality of the last twenty years is greater than that of the first. By taking in this way longer periods of time, we can eliminate factors other than the time factor, and we can, at any rate, feel strongly suspicious that the mortality of middle and advanced life is on the increase.

The same results can, perhaps, even more conclusively be demonstrated by a study of tables showing the expectancy of life.

Life Tables compared.

The late Dr. Farr constructed tables showing the expectancy of life calculated upon the death-rates of the years 1838-54, and similar tables have more recently been constructed by Dr. Ogle, from the death-rates of the years 1871-80. In the case of male children newly-born, a child born in the first period could expect to live 39·91 years if he lived to an average age; a child born in the second period

had a longer expectancy of life, namely, 41·35 years. While, however, the expectancy at birth during childhood and youth has been increased, the following table (extracted from their tables) will show that the expectancy during manhood has diminished; that is to say, men are either not so strong, or their surrounding conditions are less favourable than they were, and they cannot expect to live for so long a period. The details of this table are as follows:—

MEAN AFTER-EXPECTATION OF LIFE.

AGES.	GROUP I. 1838-1854.	GROUP II. 1871-1880.
0	39·91	41·35
5	49·71	50·87
10	47·05	47·60
15	43·18	43·41
20	39·48	39·40
25	36·12	35·68
30	32·76	32·10
35	29·40	28·64
40	26·06	25·30
45	22·76	22·07
50	19·54	18·93
55	16·45	15·95
60	13·53	13·14
65	10·82	10·55
70	8·45	8·27
75	6·49	6·34
80	4·93	4·79
85	3·73	3·56
90	2·84	2·66
95	2·17	2·01
100	1·68	1·61

Physical Degeneration of the Race already indicated.

It seems improbable that the short expectancy of middle age can be due to modern overstrain, for

external conditions are on the whole improving, and the same fact may be observed in the expectancy of women, who certainly have not been placed under more unfavourable external conditions. Calculations from other periods of years would be here of great value, in order further to eliminate the effects of climatic changes, etc., and it must be remembered that the figures which are the basis of all statistics are only approximate to, and never exactly represent, the true condition of things. For these reasons, it seems important to pursue statistical investigations still further, and to examine the returns of other nations in order to determine whether or no their facts are similar to ours.

In the meantime, we may view, and not without inquietude, the probability that our statistics, as far as they go, indicate that racial deterioration has already begun as a sequence to that care for the individual which has characterised the efforts of modern society. The biologist, from quite another group of facts, has independently arrived at conclusions which render this view in the highest degree probable

CHAPTER IV.

INSANITY AND ALCOHOLISM.

Nerve Derangements—Insanity.

WE saw in the preceding chapter that during quite recent years the dangers of early life have been greatly lessened because of our increased knowledge of infantile hygiene, and from the fact that the infective diseases, which are always most dangerous to the young, have been greatly abated. We saw, however, at the same time, that the constitutional weaknesses of humanity are by no means lessened, and that there are strong grounds for believing that during the last thirty years the race has observably degenerated, a result to be anticipated from the withdrawal of selective influences during childhood and early life. Amongst these constitutional weaknesses we may specially notice defects in the respiratory, circulatory, nervous and other systems, as being of interest and importance, and their observation worthy of our close attention. In this little treatise it is impossible however to do more than shortly to allude to

hereditary defects in the nervous system associated with incapacity, a tendency to insanity, or to excesses in the use of alcohol. The subject is not only one of popular interest, but it can be understood by those who are not technically instructed.

Just as no two men agree in the possession of equally sound mucous membranes or lung tissues, so we may have decided variations in the brain tissues. Together with unsound brain tissue we have symptoms which we call mental derangement, and of these we have an infinite variety, starting from the mentally too excitable, or too inert, and passing on to those who are more obviously diseased and useless, and finally to those who are dangerous to society at large. Now, these brain affections are markedly hereditary —proverbially so indeed. It is true that an overplus of work, or anxiety, or depressing surroundings, may produce insanity or other nervous conditions in one who under better surroundings would undoubtedly escape. These are, no doubt, true exciting factors, but they act with alarming ease in the case of certain types, while in others their action is relatively inoperative. This type, an organic variation, is transmitted, it is not destroyed. As Dr. Bastian says: "It is now a well-established fact that persons who are endowed with a neurotic habit of body very frequently transmit a similar tendency to their children. It is not a tendency to any particular nervous

disease, but a vulnerability of the nervous system as a whole, which is transmitted, so that under the influence of even a comparatively slight strain the weakness may manifest itself in one or other of several ways." Speaking of the suicidal tendency, Dr. Maudsley remarks: "It is, indeed, striking and startling to observe how strong the suicidal bent is apt to be in those who have inherited it, and how seemingly trivial a cause will stir it into action. Persons affected by it will sometimes put an end to themselves on the occasion of a petty contrariety, or when they are a little out of sorts, and with almost as little concern as if they were taking only a slight journey." In half his cases Dr. Maudsley traced an inherited fault of organisation. And again, speaking of the many ways in which a neurotic taint may manifest itself, he says: "In families where there is a strong predisposition to insanity, one member will sometimes suffer from one form of nervous disease, and another from another form: one perhaps has epilepsy, another is afflicted with a severe neuralgia, or with hysteria, a third may commit suicide, a fourth become maniacal or melancholic, and it might even happen sometimes that a fifth evinced remarkable artistic talents."

It is generally supposed by the members of the medical profession that insanity is on the increase, and this is in accordance with the fact that deaths

from several diseases of the nervous system are on the increase too. This supposition has, however, been hotly disputed, and may be left in other hands for final settlement, for it must be remembered that our statistics date back but a few years, a day as it were in history, and we must not presume to be able to settle offhand every problem that arises.

The Importance of preventing its Transmission.

For our present purpose the hereditary nature of the neurotic temperament is the important point that we have to consider, for its hereditary nature places it in the category of affections, which ought to be eliminated by selective means, instead of being provided for merely by the personal treatment of those who suffer from it. It is true that by the selection suggested the world might lose the occasional genius which is found here and there in families with a strong taint of insanity, but on the other hand it must be remembered that by far the greater number of distinguished men and women have been derived from vigorous and mentally sound parentage; for the association which we make between genius and insanity is due not so much to its common occurrence as to the possibility of the co-existence at all in the same family circle of these two things that at first sight must appear so strangely opposed to each other.

With a certain amount of sacrifice, humanity by selection might free itself from those types who are a drag upon the resources of the community, and who suffer themselves, certainly in the melancholic cases, to a degree which it is impossible for an ordinary individual to experience.

Marriages of Insane Persons.

While there has so far been no organised effort to bring about this selection, for we have not yet turned our attention with sufficient interest to the race as a whole, yet there is a popular and widespread feeling against the marriage of those with a distinct family history of insanity. This feeling has had in the past an undoubtedly selective influence, and has in some measure diminished the number of marriages with neurotic families; and the strengthening of this feeling in the future is the only thing we have to look to, as matters stand, as a means whereby the race may free itself from an inherent weakness of a most distressing kind.

Alcoholism a Habit, and Alcoholism a Sign of Mental Instability.

Not unfrequently we hear of the hereditary tendency to alcoholism, and it is generally understood that a specific tendency to drink alcohol is transmitted. To

me it appears that the facts at our disposal seem rather to warrant the conclusion that most of those cases which are supposed to be examples of transmission, are really due to the permanence of intemperate habits in the same family or district perhaps for generations, and that in these cases the children drink from the force of imitation. In other cases I would rather infer that unbalanced vicious temperaments are transmitted, but that as to the way in which these will manifest themselves it depends much upon the circumstances and surroundings of the individual, who may become a drinker, an opium eater, or a profligate, or perhaps a combination of all three.

Drink is a Selective Agency.

Among the lower classes at the present day there are, no doubt, whole families who generation after generation have had a bad name for drunkenness; but it would appear that in these cases the drunkenness is but one manifestation of the same careless or vicious temperament, which shows itself also in idleness and crime. Among the middle and upper classes a generation or two ago families of hard drinkers were often known. In these cases, as one may learn nowhere better than from Barrington's "Sketches of Irish Life," the drinking was a part of a general devil-may-care temperament, or was even in many cases

associated with a pride in the accomplishment itself. At the present day, when drunkenness is looked down upon as disgraceful by the better and more educated classes, excessive drinking has vastly diminished. It is fair, therefore, to conclude that, while what we may term unbalanced temperaments and instincts of self-indulgence are inherited, the actual way in which these instincts will manifest themselves depends upon the surrounding conditions which may happen to prevail. Such unbalanced persons would under certain surroundings of training and education fall a prey to drink, as when they are associated with drunken parents or friends; under other surroundings they may be guilty of crime or debauchery and tend in any case to avoid the quiet, orderly routine of citizenship. While, therefore, we can hardly say that the tendency to drink is hereditary, yet we may affirm that certain type variations, running, no doubt, in families, are especially liable to drink and other forms of vice. It follows, too, that drink may be looked upon as a selective agency—one constantly thinning the ranks of those who are weak enough by nature to give way to it, and leaving unharmed those with healthy tastes and sound moral constitutions.

Parents who drink from Habit may have Debilitated Offspring.

In a former chapter we have suggested that the alcohol circulating in the parental veins may affect the germinal cells, not in such a manner as to make those cells develop into individuals with a tendency to drink, but rather with the result that debilitated offspring are often thereby produced. It is quite conceivable that this latter effect may be brought about, although our study of the infective diseases has indicated to what lengths the whole system may be affected without the production of any permanent change in the germ cells; but it is, I think, greatly over-stating the case to adduce examples such as one brought forward by Galton, in which we are told of a man who had begotten children of the ordinary type becoming a drunkard, and afterwards having imbecile children. This seems to me to be very questionable evidence indeed. We can seldom ground any general rule on the basis of a few isolated cases, and just as one may support almost any argument by means of a text of Scripture, so one might bring forward isolated cases to support almost any view of heredity. Amongst the some forty million instances of transmission to be seen at the present day in the British Islands and the many thousands of imbeciles and drunken parents, one hardly wonders at what may after all be only a

coincidence. That this is a coincidence, and that the production of the imbecile children had no necessary connection with the drunken habits of the parent will seem to us very probable when we reflect that in the Scottish Lowlands, large English towns, and in parts of Germany, habitual heavy drinking is exceedingly common; therefore, did such startling cases of transmission occur, they would occur frequently, and be matter of common observation and comment. While refusing to accept this case in evidence, it is still probable on general grounds that the offspring of habitual drunkards suffer hereditarily, but definite evidence on this score appears still to be wanting.

Preventive Measures.

This leads us to the question as to whether or not legislation with a view to prevent the sale of alcohol would further or retard race progress. Experiments of this kind have been, and are being tried—notably in Scandinavia and the United States; and there are those who strongly advocate preventive legislation in our own country.

But has this enforced diminution of one particular form of vice given us any guarantee as to immunity from the other forms into which the habitual drunkard may develop? That preventive measures have diminished drunkenness cannot for a moment be denied,

but this diminution is certainly not more notable than the corresponding change in the habits of the English middle classes brought about entirely by the force of conscience and habit. Granted that preventive measures will improve the individual, we have to ask ourselves the question, how will they improve the race?

Drink among Australian Convicts.

Dilke informs us[1] that the convict element may now be disregarded in Australian society. In the case of some their crime was an accident, and criminal tendencies would not be transmitted to the children they left behind them. On the other hand, the genuine criminal and also the drunken ne'er-do-well left no children. Drink and vice among the "assigned servants" class of convicts, and an absence of all facilities for marriage worked them off the face of the earth, and those who had not been killed before the gold discovery generally drank themselves to death upon the diggings.

We have here a very clear case in which alcohol acted as a most beneficial selecting influence. Had there been prohibiting laws, preventing the sale of alcohol, these innately depraved would have in

[1] "Problems of Greater Britain," vol. i., chap. ii.

many cases settled down, and have left behind them a population imbued with the paternal instincts.

Drink and Prevention in America.

In the United States there is and has been a strong feeling against the liquor traffic, not only on the part of those who hold that drinking is in itself wrong, and leads to crime and misery, but on political grounds as well. The Americans drink, not at meals as we do, but at the drinking-saloons and bars, and the habit of "treating" to liquor is universal. These drinking-saloons are, too, the cause of much of the political corruption deplored by the better class of Americans; there are many reasons, therefore, for the introduction of local option, or even prohibition, and in many of the states stringent anti-liquor laws are consequently enforced. Inasmuch as these laws have been in operation for some years, we can study their effect on those who have been subjected to them.

We are told[1] that in Maine a Prohibitionary Law was enforced in 1851, lapsed for two years (1856 and 1857), but has continued since that time up to the present date. We have, therefore, an experiment

[1] "Liquor Legislation in the United States and Canada." Rathbone and Fanshawe.

in liquor prohibition lasting for forty years. In Maine, the manufacture and sale of alcohol in any form is illegal, and punished by imprisonment and fine. The law is enforced, and we are told[1] regarding its operation that, "by tending to drive the traffic into by-ways and disreputable 'dives,' by removing the visible temptation offered by open bars and saloons, by making it relatively if not absolutely difficult to obtain drink, and by throwing a general atmosphere of subterfuge and disrepute about the trade, it has been a material agent in suppressing a demand which is not only regarded by many as morally wrong and physically ruinous, but is rendered by the operation of the law disreputable. These tendencies, receiving support from the general voice and sentiment of the women, have so influenced manners that, whatever share in the result ought to be assigned to the effect of prohibition, it is a fact that the demand for liquor, or the desire for it, either in large quantities or small, proceeds only from a limited section of the population." If now we turn to the statistics of crime, pauperism, and insanity, we shall find a result which may appear a startling one to many. The statistics of the Insane Hospital show a great and progressive increase of patients, from 75 in 1850-51 to 685 in 1891-92. In regard to in-door

[1] *Op. cit.*, p. 104.

paupers, the ratio is slightly lower than that of the neighbouring states :—

	1880.	1890.
Maine—ratio of paupers per million of population	2319	1756
Other states, non-prohibitive	2339	1790

In regard to out-door paupers, the census attaches to Maine a number very considerably in excess of the average. As regards prison population, Maine has a low but decidedly increasing ratio, which comes out especially clearly in the case of the juvenile offenders in reform schools :—

	1880.	1890.
Maine—ratio per million of population in reform schools ..	176	256
Average in other nine North-Eastern states	469	425

In Kansas, another state in which prohibition prevails, dating from 1881, the United States census tells us that there were more prisoners in its penitentiary and county gaols in proportion to its population in 1890 than there were in 1880, and that of all the neighbouring states Kansas had in 1890 absolutely the largest ratio of prisoners to population. In Iowa, the third state in which prohibition has been most effectually carried out, we are told [1] that "in one small town prohibition was so effectually enforced that, when the bishop of the diocese visited it, an intended celebration of the Sacrament had to be abandoned because no wine could be obtained.

[1] *Op. cit.*, p. 170.

In this town we are also told that opium dens are formed as the alleged result of prohibition, and my informant, whose testimony was unimpeachable, was told by a physician practising there that the use of opium in the place was a positive curse; he had twenty or thirty cases on his hands of persons suffering from the habit, both men and women."

Public Habit and Conscience the best Preventive.

One may often draw false deductions from statistical evidence through ignorance of facts, which qualify and give quite another colour to the figures quoted, but the above data suggest that any lasting prohibition, other than the dictates of a man's own conscience and sense of self-respect, may do more harm than good; for when not upheld as a fashion, excessive drinking can only be looked upon as a symptom of a debilitated or depraved nature, which, without access to drink, would show itself depraved in other ways, and which, if artificially kept sober and assisted thereby to live, will tend to perpetuate itself and widen the circle of its depravity.

May it not be said that a clear case is to be made out for the introduction of preventive measures in districts where drunkenness has become a matter of universal habit or fashion, where, therefore, the selective action of alcohol—from the fact that al-

most all take it—is reduced to a minimum, and where, from its general consumption in injurious quantity, the debility possibly transmitted may be considered as reaching towards a maximum? In this case preventive measures, introduced perhaps for a few years only, would be instrumental in getting the people into more reasonable habits of living, and might enable those who possessed the necessary tastes to cultivate such pastimes and recreations as would keep them free from falling victims to a vice, to which they had previously given way rather from force of imitation than from any strong *personal* predilection. On the other hand, from our point of view, that of racial progress, the case for preventive interference is not so clear when introduced into a district where the population have in the mass learnt to lead sober lives, where drunkenness is looked upon as a vice, and where only those naturally without self-respect and proper self-control fall victims to drink; the artificial interference prevents the operation of a selective influence which eliminates from society many of its most undesirable elements. Under these conditions excessive drinking is but the symptom of something which lies deeper, namely, an organic defect, a poor and vicious type, and its prevention cures the symptom, while the disease remains and perpetuates itself to the hapless children of the future.

The Power of the Community over the Individual.

It might appear to the superficial reader that I am advancing arguments which would give a moral sanction to the broadcast scattering of the germs of phthisis and enteric fever, and to the leaving of unlimited whisky as a stumbling block at the doorsteps of one's weaker neighbours. This is far from being the case. While it is undoubtedly true that the germs of phthisis have from time immemorial been freeing humanity from an unhealthy variation to which we are subject, and while alcohol has on the whole been ridding us of the vicious and uproarious since our forefathers first drank mead from the teats of the she-goat Heidhrun, yet it does not follow that any individual or set of individuals have a right to take upon themselves the responsibility of retaining and meting out such selective treatment.

Were there, indeed, no other means of improving the race and eliminating its at present inherent faults, it might be different, and, perhaps, one could hardly say that society might not take upon itself the responsibility of the actual outrooting of these faults by drastic measures ; but other ways are open to it. At present society claims the right to exterminate the murderer, and a few decades back the life of the thief was also taken. But while these

lives were taken by a custom which is the survival of retribution, and in which the State takes the place of the injured person or family, there is a growing feeling that such a motive is not of the best or highest, and that the only excuse for the disposal of the life or person of the individual is that of the seeking of the general well-being of the State. When we consider the enormous sacrifice in modern times of what were at one period thought to be personal rights (such as the right of every man to ill-treat and neglect his wife or children, or to live in whatever insanitary house or room he pleases, or to work as long as he wishes, etc. etc.), we can hardly draw, even in imagination, a line beyond which the State may not, at some future time, see its way to make claim upon the individual. It is, however, very improbable that the advanced politicians of any century will ever call for a general battue upon the inveterate drunkards or consumptives, nor is there any likelihood of the work of preventive medicine abating for one single instant, even for the sake of the race. The love of the individual is antecedent, both in the history of humanity and in the life history of each individual, to any regard for the race, and the latter is but an extension of the former feeling. While, therefore, there are certain and sure means of improving the race by simple and unheroic measures, no one would for a moment dream of de-

priving the individual of all that modern medicine and civilisation can do for him.

The Necessity for replacing One Selective Agency by Another.

The microbes and other selective agencies have been improving the race, or at any rate have in the past been preventing its deterioration, but it by no means follows that this action is to be permitted to them in the future. We have studied them and have followed out their life histories; we know on what they thrive, and also that which is injurious to them; we can exterminate them; and human affection, that emotion beyond all others that we have to trust to for race perfection, demands complete control over "their reckless inroads." But if the selecting microbe is to disappear, we have to replace it by something else. If the individuals of to-day are to have the advantage of better surface drainage, and an absence of their microscopic foes, the children of the future must not be the sufferers; and we must replace the selective influence of the microbe by the selective action of man's forethought, which shall provide that these children shall alone be produced by healthy parents. We need have no fear of the removal of the selective influences that at present surround us, provided a selection is still carried

on; but if we remove selective influences without replacing them by others, then racial decay is certainly and inevitably upon us. At the present time people with strong strains of insanity or phthisis marry freely. The dangers are to a certain extent realised, but these are generally overcome by the power either of personal attraction or dowry. A man may be summoned for neglecting to send his son to school, but at present there is no strong public feeling against the knowingly begetting a son who all his life may suffer from weak lungs or brain, and hence obvious disease is no bar in the marriage market.

How it is that the Production of Children by Diseased Parents is tolerated.

We cannot wonder at this state of things when we recall the fact that in less advanced times than the present a rapidly recruited population was often the determining cause of a nation's continued existence. The depopulation produced by war and zymotic disease was often so dreadful that nations with great fertility alone survived; and thus it came about that all minor questions were sunk in the one great necessity, namely, that of keeping the population large enough to resist extinction or to effect foreign conquest.

Added to this, most of the sickly diseased offspring died in infancy as a result of improper feeding or

want of care, and there was no such thing as the existence of a large section of the community evincing an increase of hereditary weakness. Under these conditions the parents of large families added so much the more to the strength and power of the community, and the production of children came to be regarded as a virtue. This view of the question very naturally survives, and is probably the reason why at the present day marriage with a diseased person is not viewed as a sin against the children that are to be produced, and against the community at large.

The Necessity for producing Posterity out of our Best Types.

The end then towards which we have to aim is the production in each generation of children from the best and healthiest of the population alone, for it is surely only reasonable that we should as a community pay the same care and attention to our own race propagation that a gardener does to his roses or chrysanthemums, or a dog-fancier to his hounds or terriers, or a cattledealer to his southdowns or shorthorns. That there is no means of improving our race so efficaciously as by selection we may be certain, and that there is no other way is highly probable; our interest in the subject, and the value we place upon changes

the effects of which we shall never live to see, will determine whether we are prepared to adapt our ideas and modes of action to the lines that reason and the knowledge of the times have clearly pointed out as the only ones which it is expedient to follow.

I have so far only indicated in most general terms the aim which in my opinion we should have in view. We have in the two succeeding chapters to consider several problems somewhat similar to those which we have already discussed, and then it will be more easy to obtain a general view of the whole question. We may then consider what steps it may be advisable to take with a view to bringing about satisfactory selection of the population, remembering always that in such a matter nothing can be accomplished which has not the sanction and approval of the mass of the community. The education and conviction of the masses must precede legislation, so that we shall have to consider what is expedient, from a practical point of view, for us to do at the present time, and we shall leave speculation as to possible future action to those who have greater gifts of foresight, and who believe in the possibility of predicting the future action of such a complex machine as an empire of men and women.

CHAPTER V.

THE CRIMINALS, INCAPABLES, AND THOSE IN DISTRESS.

WE have seen in the last two chapters that there is every reason to believe that, on account of improved external conditions, and notably of the sanitary advances which result from the efforts of preventive medicine, the race is deteriorating in general constitutional robustness. Those selective agencies which in more primitive times destroyed the sickly, especially during their early years of life, have in part been removed or modified, with the result that the sickly are preserved and in larger numbers live through and into the child-bearing period, raising the mean duration of life, but notably increasing the rate of mortality after middle age. These sickly ones leave children behind, who, as a matter of course, transmit their constitution to the race. In our study of disease we included intemperance, for in cases where there is a distinct liability to give way to drunken habits, and apart from those cases where it is merely a habit acquired in bad company, we may look upon it as a

symptom of some innate variation from the normal, and it is therefore the physician's duty to treat it like any other constitutional disease. In the same light we are bound to view the cases of many criminals and persons who from some inborn defect are incapable of doing their share in the work of the community.

Crime is often an Acquired Habit.

It is probable that a large proportion of criminals are the creatures of accident or of vicious training. Children are very imitative, and are apt to acquire the habits and even modes of thought of those who surround them; and bad example in their homes, or the neglect of parents who, perhaps, in their turn had also suffered from bad example and neglect, has often stamped a child's character for life. At school again, the child is surrounded by influences which often affect him throughout life for good or for evil, and later on he is still susceptible to many evil temptations which may in his case be exceedingly strong. We are therefore all of us a compound of our innate inborn qualities, and those that have been stamped, as it were, upon us by contact with the external world; and we have no right to judge in an off-hand manner of the innate qualities of a criminal without a very extensive knowledge of his upbringing, and of the temptations and influences

which have surrounded him. Theft by a person in necessity need by no means imply so vicious a temperament as that of a man who spends his life in getting the better of his less clever neighbours, and enriches himself by the loss of others, as is done in many so-called legitimate ways; and the killing of a man in passion may be done by one who would be incapable of settling an old grudge by taking a mean advantage of an enemy. Again, many criminals are incapables driven to crime through their incapacity; therefore with the incapables let us study them.

The Innate Criminal.

Over and above those we have just mentioned, however, are a band of innate criminals whose feet take by nature the crooked rather than the straight path, whose lives alternate between abuse of public law and the punishment thereby entailed. These beget children, and the suffering they inflict and have to endure is continued from parent to offspring. In every locality these inveterate criminals are well-known to the administrators of justice. Time after time they come up for punishment, and wantonly and wilfully all chances of improvement are thrown away; they seem wanting in those feelings of individual responsibility, and in the wish to be held in

esteem, that are among the necessary first principles of life in an organised community.

The Jukes Family.

The histories of many of these criminal families have been written, and perhaps the best known and most striking is that of the Jukes family, written by R. L. Dugdale. This family was traced by Dugdale for seven generations, and during that time it contributed to the welfare of the State an unparalleled history of pauperism and crime. It is seldom, indeed, that the history of crime can be traced so far as it can be in the case of the Jukes, and the reason is that most families disperse by intermarriage, and the taint becomes diluted and no longer stands out in prominence. The distinguished French novelist, Emile Zola, who, in a series of novels, traces out the history of a criminal family, falls into the error of supposing that such a thing as a long family history of crime is possible without isolation from the rest of the community. The family of the Jukes lived in a district by themselves in America, and they formed a family clan, and intermarried amongst themselves, thus complying with this isolation which is a necessity for the long continuation of any family characteristic.

Intermarriage does not stamp out Criminal Tendencies.

It might, perhaps, then be said that intermarriage and dispersion of the criminal taint is, indeed, the most ready way of getting rid of it. But this cannot be so, for it is more reasonable to suppose that although by intermarriage the intensity of the criminal tendency may be diminished, yet for the same reason individuals with this innate tendency will be all the more increased, and that the further intermarriage of these individuals with others having similar taints of character, may at any time tend to again reproduce the inveterate criminal in perpetual recurrence. We may dilute ink with water so that we can no longer see that it is black, but we dare not draw the inference that the ink has been destroyed. It is equally as impossible to believe that the criminal taint can disappear unless the criminals are prevented altogether from adding their progeny to those of the rest of society.

It might be urged that in the case of the family of the Jukes their crime was due to imitations of bad habits kept up in the isolated district in which they lived. It must be at once granted that much of their crime and pauperism was no doubt due to bad upbringing, and the polluted moral atmosphere in which they lived; nevertheless, we are justified in believing the existence of such a thing as innate want of moral

backbone, of which they were a probable example. We have not to go far to find in our everyday experience of life that out of a family whose members are most of them docile, yielding to discipline, and capable of affection and self-sacrifice, one or two, perhaps, seem by nature to be wanting in these qualities. Such sporadic cases are only to be explained on the ground that imperfections in their ancestry have cropped up in the new generation, for the criminal taint is a fact to be observed and accounted for like any so-called physical peculiarity of form or feature. It follows, too, that we are bound to look with the greatest pity and commiseration upon the inveterate criminal as upon a person diseased, and that we should use our best endeavour to prevent the recurrence or continued permanence of such a type.

Segregation of the Criminal an Ultimate and Effectual Resort.

We, therefore, come face to face with the necessity for practical action on our own part if we would fulfil our obligations to those who will come after us. As Pike remarks,[1] "Perpetual imprisonment of the irreclaimable—imprisonment not only nominally but

[1] "A History of Crime in England," vol. ii., pp. 579, 580.

really for life—would be among many causes of that change in the general tone of society which is shown by history to be the greatest preventive of crime as now understood. Like persons affected with scarlet fever or other infectious maladies, the propagandist criminal should be confined in his proper hospital—a prison—and if incurable should be detained until his death. Like phthisis or other hereditary disease, the criminal disposition would in the end cease to be inherited, if all who were tainted with it were compelled to live and die childless. The remedy may be painful, and even cruel, but perhaps greater cruelty and greater pain may be inflicted by the neglect which leaves physical and social ills to spread themselves unchecked."

Many of the innate criminals, and those who have committed crime rather from the effect of want, or bad example, than from any inherent tendency, sooner or later fall upon the parish. Within the same wards of the poorhouse, or receiving the same out-door relief, we find this criminal class together with the incapables and deserving poor. This is, indeed, a most unfortunate state of things, for we are bound to draw a strong line of demarcation between those, on the one hand, who are in want through acquired habits of idleness, those who are innately incapable, and those, on the other hand, who are afflicted during their lifetime by sickness, adversity, or old

age. We habitually speak of these classes as "the poor," and the unfortunate use of this term as a common description of totally distinct conditions has led to most undesirable consequences.

Our Unfortunate Use of the Word "Poor."

With us everyone who has not sufficient means of subsistence we term "poor," we assist them out of the public purse, and we consider that in so doing we obey Christian teaching. This theory and its practice are due to a slovenly habit of mind, and perhaps also to an incomplete acquaintance with Scriptural teaching. The "poor" of Bible language means obviously the deserving and unfortunate, probably the incapable, but certainly not the habitually idle and vicious. We are not led simply to infer this, for there are positive statements to this effect. St. Paul said: "If any man will not work neither shall he eat,"[1] and again: "He that doth not provide for his own house is worse than an infidel."[2]

The Unfortunate, the Aged, the Incapables, and the Vicious, are treated alike.

Our forefathers were more discriminating in this respect than we are, and even in the reign of Henry

[1] 2 Thessalonians iii. 10.

[2] 1st Epistle to Timothy v. 8.

VIII. the line was drawn between "poor, impotent, sick, and diseased folk, the sick in very deed and not able to work, who may be provided for, holpen and relieved, and such as be strong and lusty, who, having their limbs strong enough to labour, may be daily kept in continual labour whereby everyone of them may get their living with their own hands." If, however, we look a little closer into the matter we shall be able to recognise at least three quite distinct classes of persons grouped together under the term "poor," and all of whom are treated by the community very much on an equality. As we shall presently see, the rough and ready way in which we view these three groups has led to gross cruelty and injustice on the one hand, and to ill-advised assistance and help on the other.

Within the same rooms and wards of the poor-house, or receiving assistance under the same system of out-door relief, we find those who, from innate or acquired vice, form the criminal class, undistinguished from worthy and respectable men and women and their children, whose only fault was, perhaps, that their small savings over and above the necessities of their life had been spent too carelessly, or even had, perhaps, been invested in a society administered by dishonest men; we find widows and orphans of men who have died from accident or disease while in the course of regular and honourable employment. With these

will be mixed the class we have especially to study—the incapables; a poor type, with physical and mental defects, such as insanity, epilepsy, and idiocy, and with these many vagrants must be included. Where laws or regulations are framed to deal with these three classes, as if they formed one natural class, the greatest injustice of necessity follows. The law-makers have to deal with the idle and vicious as well as with the deserving and distressed, and by grouping these classes together and framing regulations to apply to all, some are of necessity treated more kindly than they deserve, while others become the victims of unmerited brutality.

This fact was first brought forcibly home to me by a case in a north country poorhouse—a case which quite represents the present disgraceful method of treating those without means of subsistence. A woman, a soldier's widow, whose husband and three sons (all soldiers) had been killed in active service, was left without relatives. She supported herself and lived soberly until old age, when feebleness and commencing gangrene of the foot compelled her to seek the poorhouse, where she died alone and unvisited by any friend. I saw her in the next bed to a drunken prostitute. The one woman had given of her body to the country's defence, the other had given of her body to its ruin, and yet the country treated them both alike because they were alike in want of bread.

Lawyers and law-makers have tried, with limited success, to cope with these questions ever since the first Poor-law in 1601; they have failed, perhaps, because of their point of view and of approach. The physician, accustomed as he is to study his cases, each with their peculiar symptoms, and each with their appropriate methods of treatment, would, perhaps, have done better than his legal brother. We must look deeper than the mere surface, we must not be content to give bread and pass away, and feel that our duty is done.

Our Poor-law Regulations are at Fault.

In reference to the first class, those who are lazy and vicious, and will not work although capable of it, we have to remember that the community is itself to some extent to blame for the present state of things.

Before 1834, the Poor-law in country districts habitually supplied the unemployed with what was considered a sufficiency, and those who maintained themselves by independent industry and capacity often fared worse than those in receipt of regular Poor-law aid. "Poor is the diet of the pauper, poorer is the diet of the small ratepayer, and poorest is the diet of the independent labourer," remarked a witness in the Poor-law Commissioners' Report of

1834. It cannot be denied, therefore, that there is a certain want of independence (especially perhaps in rural districts) engendered by methods of relief administered in past times. As a result of this, those without physical and mental disqualification for work fall back on the Poor-law for relief in time of distress, and, counting on the certainty of this relief, are less strenuous in their efforts to provide against the evil hour. Vice, too, is increased in those who know that during the incapacity which may follow its exercise the workhouse door is open to them, and that food and shelter are to be had between the intervals of each debauch.

It was for the benefit of the sickly, the aged and other really deserving poor, that organised charity came into existence, but it too often has been the lazy and vicious who have profited thereby.

The Idle and Vicious are Subjects for the Criminal Law.

But though society has made so great a mistake in the past, it is no reason that this system should continue. And that it should do so is inadvisable, both in the interests of the ratepayers and in the interests of those upon whom the rates are spent.

The poor-rates are generally paid with extreme reluctance, whereas were it felt that they were to be

props to the aged and needy, this reluctance would largely vanish. People are generous enough—witness the cordial support universally given to supplementary charities — but few pay their poor-rates willingly, for they know that in most cases these rates go to the support of the drunken, vicious and lazy. As to the paupers themselves, not only would increased funds be at the disposal of the deserving poor, but the moral atmosphere of the poorhouse and relieving office would be altogether purged by the exclusion of the sturdy beggars, of those who are able-bodied, but idle and vicious, who should be placed apart and treated under separate regulations. They are subjects for the police and for the criminal law; as outcasts from humanity, we may endeavour to reclaim them, but whilst unreclaimed, let them feel the full effects of their misconduct. The prison cell is warmer than the rock cranny or pit in which the primitive Briton sheltered himself, and the prison fare is better than was his food. Why, then, should the idle and reprobate vagabond receive the advantages of a civilisation built up by the busy toil of those around him, a toil in which he will take no part?

To this class we may, if we will, offer work, but in offering bread, we undertake a greater responsibility than we perhaps are aware of. Food and clothing means the power to live and marry, and as there are

limits to everyone's resources, when we give anything, even a penny to a passing beggar, we are giving some of this power, we are taking upon ourselves the responsibility of "selecting," and are influencing this selection, let it be in never so small a degree. We are playing with humanity the part of the gardener with his flowers, or the farmer with his stock.

This is a very high function, and a difficult one to perform judiciously, yet we all of us presume to exercise it without thought or training. There can be no doubt that the lawgivers responsible for the present condition of public charity, and private individuals who assist cases whose thorough investigation they have been too lazy to take up, are in part responsible for the perpetuation of the criminal classes in the community.

The Poor in very Deed.

If we place the vicious and idle, though capable, pauper on one side, in a class by himself—a criminal class—we can deal fairly and reasonably with the other two classes.

Under the varying conditions of life some people are hardly pressed upon, and the burden is light upon other persons' shoulders. Our conditions of life, although perhaps selective in the main, are by

no means uniformly so, and thus it happens that the amount of money in a man's pocket is no certain criterion of even his capacity to make it. Especially in a community such as ours, where men pass in a lifetime from poverty to riches or the reverse, and often as a result of surrounding conditions over which they have no control, we may have stupidity and vice reposing sumptuously on inlaid Florentine, while intelligence and virtue are seated on rush-bottom. As I hope to bring out shortly, there is too little selective influence in a civilised state. Some of our old aristocratic families were headed no doubt by men of great capacity at their commencement, but it was the organisation of Romish civilisation that gave them the conquest over their worse organised fellow-kinsmen settled in England. Blood for blood, innate quality for innate quality, there was little to choose between them, yet circumstances made one the villein and the other the lord. Selective influences that might have operated in a savage community have been kept in abeyance to a great measure by inherited property and class distinction; and though, fortunately, good men are continually rising, and vicious, idle men are falling, yet this is to a great extent kept in check. Thus we find in the lower class many men and women of excellent physique and mental capacity doing in their lives as much as can be expected from anybody. From the bio-

logical point of view—that of blood, bone, muscle and brain, a view which we, in our biological study, are bound to take—the lower labouring class is little inferior in quality, whilst they exceed in numbers the upper and middle classes. From the changing conditions of life (conditions that are not uniform in any class) they especially suffer, for they are nearer the limit which, if passed, means deprivation of that which is necessary.

Our Misguided Attitude to these.

We have, therefore, no right to assume that when we find destitution around us the destitute are of necessity more to blame in their lives than we are in ours. They may have been hardworking and provident, and yet have fallen victims to want. Any note of condescension in our attitude towards this class is an impertinence of the grossest nature, and it is our duty, if we help at all, to do so as one brother to another, simply and naturally. The recipients of help should be allowed to feel that they are receiving only what they would themselves be prepared to give; that they should receive it, not as a dole to be eaten in bitterness, but as a friend's gift to be enjoyed.

In these cases we are far too apt to stand aloof and do nothing, or to interfere only when it is too late, so that while the very scum of the criminal

classes are being supported, worthy members of society are allowed to pass through circumstances of the utmost distress without a helping hand. The numberless stories, many of them undoubtedly true, of the large sums yearly made by well got-up begging swindlers, show how little our emotions are guided by our reasoning faculties. We are too prone to give when our feelings get a shock, and we are too often incapable of acting in anticipation of a catastrophe which is not already before our eyes. How many there are around us in difficulty, who, with some judicious help, might themselves regain prosperity. Too often we wait till it is too late, till all is practically lost—till, in fact, our "feelings" have been sufficiently acted upon.

The Incapables.

While the first of the classes into which we have divided the "poor" are destitute as the result of vicious training, and the second from the hardships of their special surroundings, the third class are destitute from innate incapacity. To the idiots, insane, epileptics and others suffering from severe constitutional defects, there must be added the vagrants who will not, because they cannot, do regular work. I say "cannot," for I believe the vagrant class forms an interesting and ill-understood body by themselves.

They fill our workhouses, to which they crowd in inclement weather, leaving the towns for the country in spring, and returning to them in autumn. They sleep in barns, under ricks or hedges, and live on what they can find or beg or steal. They marry and have children, who are often a source of profit from the increased charity they bring. Give them a spade to dig, a hammer with which to break stones, or a garden to weed, and they tire of the constantly repeated action, be it ever so simple; complex manipulations, or tasks requiring forethought or attention, are for them quite out of the question. They will keep rooks out of the fields, tramp after bulrushes, or trap a rabbit, but an unexciting occupation with a result not immediately attainable is to them unendurable. We can hardly fail to see in this class, in many cases, the direct descendants of our more savage ancestors, who most probably never mingled in the streams of civilisation that have flowed by their side. They have continued to exist by the primitive and precarious means adopted by early men to gain their livelihood. Charity, firstly of the monastery, and secondly of the Poor-law, has kept them alive, and we have them by our side to-day.

Segregation Ultimately Required for their Elimination.

Whatever be their origin, there they are, leading an

existence that is an anachronism and an anomaly in our civilisation. Theirs are the hardships and privations of the savage, but from their position in society, of which they form the lowest dregs, they have not his advantages. Their neolithic ancestor who lived in the Sussex Downs or the Yorkshire Wolds, and shot buzzards with flint-tipped arrows, felt a superiority amidst his surroundings, and we have every reason to believe he was as proud a man as any one of us. But the poor tramp, an outcast and a dependent, lives a life worse than that of the shepherd-dog in the fields, and perpetuates this misery from century to century. Here, as with the idiot or epileptic and others of this class, there is clearly a case for segregation. All are obviously unfit to perpetuate themselves, and in the best interests of the human species they should be prevented from so doing.

We have seen in this chapter that just as preventive medicines and the luxuries and comforts of modern civilisation have so far tended towards race deterioration, so in like manner our law-framers have done their best to perpetuate some of the worst strains that society possesses, strains that in a community without poor-laws would many of them have long ago ceased to exist. While, therefore, it is quite clear that the end that we should have in view is the non-perpetuation of the criminals and incapables, any proposal to segregate these would in the meanwhile

probably be unfavourably received. In the case of the unhealthy we may hope by force of public opinion soon to prevent such marriages as are to-day of too common an occurrence, but in the case of the criminals and incapables the case is different. They are not to be touched by a sense of public duty, for they only obey the preponderating influences of the moment. Their lives will have to be ordered for them, and the responsibility of action must fall upon other shoulders. One cannot help thinking that a great step could be taken in the meanwhile by purging the poorhouses of all unworthy occupants. The criminal classes would then stand by themselves, and the public, learning gradually to regard them in their true light, would probably very soon grudge to support them, generation after generation, and would come to see that their segregation under circumstances involving no personal hardship would diminish and in time remove the evil.

Incapables to be Treated like Chronic Hospital Patients.

The incapables seen side by side with the distressed and aged would then be viewed with that commiseration they truly merit. Their lives might be made better worth the living than they are at present, and the poorhouse might come to be re-

garded as a hospital and shelter for the unfortunate, rather than as a refuge for drunkenness and vice. The denizens of these dreary buildings might then partake in their share of kindly attention, and feel some warmth of human sympathy now denied to them.

CHAPTER VI.

COMPETITION.

Competition of Brain against Brain.

IN the last chapter we had evidence enough that in human societies, just as in the animal world, a very keen struggle is going on. This struggle is seen on a colossal scale when whole races enter into combat with each other, and success attends the one which is superior in some quality of mind or body, or that is rich in the possession of some machine of war. We have the spectacle of the Eastern king using a captive nation for the construction of irrigation works, or for the building of a temple or a pyramid; or, coming to more modern times, we see the Mexican civilisation destroyed by the Spaniards, or the wholesale extermination of savage races by the British. So, likewise, amongst the individual members of any given community very much the same struggle may be seen, in which the poor are the conquered ones, and the rich the vanquishers in the fight.

Does the Race show Increased Brain Capacity?

This competition of individuals in our own community has always been one in which brain power has been pitted against brain power, rather than muscle volume against muscle volume, and it is interesting to investigate whether or no, as a result of this struggle, our race has increased its innate intellectual capacity during the historic period, and, furthermore, what changes are likely to take place in the future.

Before we can venture to proceed with this investigation, it is necessary at once to separate from each other the question of our innate intellectual activity, and that of our intellectual property. We, in this nineteenth century, are the inheritors of a vast fund of accumulated knowledge—an intellectual property—which is infinitely greater than that possessed by the Greeks at the time of Socrates and Plato, yet I do not think that anyone would venture to assert that an average Englishman of to-day has better brain tissue and corresponding intellectual activity than that which was possessed by an average ancient Greek; indeed, some with Galton would say that the Englishman's brain power is very inferior. We have always to bear in mind that, owing to our possession of the faculty of language spoken and written, our intellectual property, like our material property in houses,

land, etc., has been, and is being, transmitted to us from generation to generation, and that we at the present time are recipients of the accumulations amassed by the restless intellectual activity of our direct and indirect ancestors. We cannot, therefore, determine whether we are increasing in our intellectual activity by the amount of knowledge we possess, and we must seek some other evidence.

Equally valueless would be a comparison between the intellectual activity of the Greeks or Romans and ourselves, taking as a test say the number of distinguished writers per million of population; for the Greek and Roman people are not related to us in direct line of descent, but are remote cousins. We can, however, obtain information which is of the greatest value as to the intellectual power of our direct forefathers at dates which may be counted back by thousands of years. Although they have left no written records behind them—for writing, even at the later part of the period referred to, was a rough implement, and placed in the hands of very few—yet they have left behind them, buried in their sepulchral mounds, their skulls, silent witnesses of the power and activity of the minds that once inhabited them.

The Neolithic compared with the Modern English Skulls.

The skull is the bony covering to the brain and the great organs of sense placed in the head; it

develops with them, and is adapted with them as these organs during growth assume their proper racial and family characteristics. By an exhaustive examination and comparison of the skulls of different individuals of different races, the anthropometrist is able with certainty to affirm regarding the skulls of unknown persons their race and their general position in the scale of intellectual development. In a race where brain power is great, the brain pan is large and capacious, to accommodate the organ within it; it is a large-brain-small-jaw skull. In a race in which the brain power is limited, we have the small-brain-big-jaw skull. In races on much the same intellectual level, but who differ from each other in special physical and mental characters, the skull is generally a recognisable feature, and one can pick out at once the long skull of an Aryan from the broader skull of a Finn or Magyar.

Many of the sepulchral mounds just alluded to have been opened, notably by General Pitt-Rivers and Canon Greenwell, and the remains of well-preserved skulls have in several hundreds of instances been found. These go back to very remote antiquity, in many instances to the Stone Age, which we may place at least before the Christian era. When these skulls are examined, they are found to be similar to many of our own. When we look at them, we feel that there is no reason to assume that they are of a

lower type than our own, or that the men and women of whom they are the remains would not, were they possessed of our advantages of education, etc., take an equal status in society with us. Some of them, especially those removed from the Vikings' graves, must have belonged to magnificent specimens of humanity.

Abeyance of Brain Development since Neolithic Times.

The evidence, and it is of a most substantial kind, would seem to point strongly to the practical abeyance of organic intellectual development from the time mankind first formed simple communities for purposes of self-defence and mutual aid up to the present time. It would follow, therefore, that although we have been accumulating intellectual property, we have not necessarily become more intellectually active.

Social Communities do not permit of the Destruction of the Less Intellectually Capable.

But it may not unnaturally be asked, How is this state of things compatible with our views regarding selection? for we have seen that struggle and competition between brain and brain has incessantly been going on, and it seems to be a natural sequence that

the brains of the community must be improved by selection.

We come here, however, to an outstanding difference between the results of the competition of one animal and another, and with that of one member of a community with another. In the animal world, the sickly, or the feeble, or deficient, have always tended towards destruction, their more capable fellows having as a rule an interest in their destruction. A sickly fowl or pigeon has not only to compete at great disadvantage with its fellows for its food, but it has to face a pitiless instinct which leads the healthy ones to destroy it as soon as its weakness is apparent. In the animal world, competition is to the death; it is competition without compromise, in which the conqueror alone remains to continue the race.

But man has become a social animal and lives in communities, and the very existence of a social community implies that the members of it have already acquired a certain regard for the well-being of their fellows, for the end and aim of society even in its most primitive form is advantage to the many. It is true that in a human community everyone does the best for himself, yet even amongst the so-called outcasts of society there are social bonds not to be found in the animal world, which link man to man often with strange tenacity. We regard our own

interests as by far the most important, yet we have some regard for the interests of others, and the most savage man is capable of that very human virtue called friendship. Hence it is that although we may pursue our own ends and aims in life, we are not always entirely regardless of others. We are content to become rich and influential while our neighbour remains poor; and so strong are our instincts of self-love, that it wounds us sorely for him to overtake or outstrip us in the race for wealth, though, in spite of this, we shrink from doing him actual injury.

Human Brain Power results merely in Wealth Accumulation.

The struggle between members of the same community is not therefore so much a struggle for existence as a struggle for a superfluity of the good things obtainable. It is a struggle for property, and not therefore necessarily a struggle in which the most successful will be the largest race producer. While the young lion is killed by his stronger rival, and while the rat with an injured limb is at once attacked, killed and eaten by its fellows, men compete with each other for power and position, and for the means of gratifying whims and obtaining pleasure. It may truly be called a race for greed in which, in the nature of things, all cannot come in first. The

well-to-do tradesman has more meat and wine than he can consume, more books than he can read, more works of art than he can understand, and yet he is not satisfied ; but there is one thing sweeter to him than anything else, and that is to pass his neighbours in the race of life, and in his turn to be equal with those who once ran before him, and who at one time looked back at him with scorn. The brute unconsciously struggles to survive through instinct of the dire necessity of self-preservation, but man's struggle in too many cases is a pastime that is sweet to him, and one which he will pursue through his whole life-time, and will follow eagerly with the tottering steps of extreme old age, although he thereby dwarfs what is noblest and best in his humanity.

While society has been unable, until lately, to do much towards the active preservation of the sickly, who have in consequence tended to fall a prey to disease and hardship, yet the foolish and mentally incapable, while they have suffered in the race for wealth, have not to any great extent been permitted to undergo extreme privation, and it remains to be seen whether they have contributed their share of progeny, for if they have done so it is easy to understand how little advance in organic mental activity can have taken place. And this is indeed indicated by a comparison between our skulls and those taken from sepulchral barrows since early neolithic times.

Further Study of Individual Competition.

Before, however, we attempt to arrive at a conclusion as to whether or not a man, unsuccessful in the world's competition, as a rule contributes more or less progeny than one who has been more fortunate, let us examine more closely the details of this competition, with a view to the better comprehension of those conditions under which it takes place.

Let us take a familiar illustration. In an ordinary foot-race the best man gets in first, provided he is in his proper form, and the race is looked upon as a test of merit. In order to encourage competitors who otherwise would be without a chance of winning, it is usual to handicap some of these races, giving points of advantage to all except the very best man who is termed "scratch." The result of such a race is no proper test of merit, and the winner is often the worst of limb and wind in the whole competing team; he wins it because of the handicap he has received. Now while the wild beast and very primitive savage are all "scratch" and no "handicap" is given, on the other hand civilised communities, as soon as they have become firmly established, introduce the system of handicapping, which does not necessarily give the advantage to those most needing it, but which all the same causes the struggle or race to cease to be so true and efficient a test of pure merit as it was before.

Those Competing are Handicapped by Properity.[1]

This is brought about in many ways, but by none more effectively than by the amassing and transmission of property. Instead of living a hand-to-mouth existence, all communities have very naturally instituted what is known as personal property; they have permitted individuals to acquire and transmit large quantities of food or clothing, etc., or that which can be converted into this, namely money. By lending this property to those who are in need of it, and by exacting a percentage increase in payment of this loan, wealth may yield in perpetuity a sufficiency to support without further expenditure of labour. By the earning, with physical or mental labour, of wealth, and by the increments produced by the loan of wealth, this wealth has accumulated in certain families and in certain classes, and this power is handed down from generation to generation. In order to obtain wealth in any quantity, great physical skill or mental training is, as a rule, required, and this is only to be obtained for a child by the expenditure of wealth on the parent's part. The wealthier families in a community have therefore either sufficient wealth to support their children in idleness, or,

[1] Consult "Darwinism and Politics," by Professor D. G. Ritchie, 2nd Edit., p. vi., upon the interference of property with natural selection.

at any rate, they can put them in such positions as will enable them to produce wealth for themselves. The children of those families who possess little wealth are from the first at a disadvantage, and only those with very exceptional powers can possibly succeed in a struggle against their more fortunate neighbours.

Property is not always acquired by the Most Capable.

But if riches and power had always remained in the hands of the most capable, and if these had always married women of capacity, then riches and power would be where they would be of most advantage; but this has certainly not been the case. As already remarked, the awards of land and wealth at the time of the conquest were given to those of the conquering side who had showed most prowess in war and intrigue, at the expense of equally capable men amongst the vanquished. England thus received a nobility who were practically on an equality with her common people, but who, on account of previous contact with the wonderfully organising power of the Romish Church, and with the more civilised communities of the South, had acquired the art of organised warfare, and thereby the necessary subordination of the many to the few, lessons that the races living in England had not had the chance of learning. In more recent times wealth and con-

sequent power, acquired by manufacture and trade, have likewise fallen to the share of the incapable as well as to the capable, to the exclusion of the greater number of individuals belonging to both classes. Those who lived on the seacoast where to the south and east the construction of harbourage was possible, profited by the development of the trade which at one time arose in those districts; while later on, and after the establishment of colonies to the west, in the States and Canada, those who lived in the coast district to the west profited in their turn by western trade. Individuals holding land of value to the agriculturist alone, and in its turn yielding great return, have found themselves penniless on account of the importation, at low prices, of agricultural produce. Others holding land containing certain mineral wealth have found themselves greatly increased in riches, and everyone in the district has profited by the find. It does not follow, therefore, that because A has acquired wealth and B has not, that A is even a better acquirer of wealth than B, let alone other qualities in which B may have an advantage. It might follow, and would follow in most cases, that A and B would determine their equality or inequality, were they placed under similar conditions. But as we have seen, their conditions seldom are similar; indeed, to a great extent, wealth acquisition is a lottery. While it cannot be granted

that every man who acquires wealth is clever at acquiring it, it must at the same time be admitted that a fair proportion of those who succeed are above the average intelligence.

Property Holders Less Capable than Property Acquirers.

But the chances that the children of such a man will also be clever in acquiring wealth are again diminished by the chances that his wife will be deficient in that very quality. We do not know exactly what part the father, or what part the mother contributes to the making of the progeny, and this very fact indicates strongly that they each give much alike; were there any marked differences between their contributions these would have been observed, for we have so many chances in everyday life for the study of such problems. We may conclude, therefore, that an average child depends for its faculties as much upon the mother as upon the father. Now, even if we put on one side the probabilities of the choice of a mate having rather opposing qualities than otherwise—for we are attracted in marriage to our unlikes rather than to our likes—the chances are that the wife of the man who has acquired wealth will not have more than average capacity. According to this view, the children born of the marriage will, on an average, have less than the father's capacity, supposing him to be a capable man.

We see, then, that the chances of finding capable men and women—innate capacity is, of course, referred to—among families inheriting wealth and position, are less than the chances of finding these qualities among those who have themselves acquired wealth, and also that it is indeed probable that the average capacity of wealth-holders is only slightly above that of the average of the whole community. That there is a slight difference we must allow, for capacity has its own value, and the ranks of the rich are continually being recruited by capables, while at the same time the ranks of the poor are being recruited by incapables.

While this is the case the sifting referred to is very incomplete, and we find in every class every range of intellectual capacity, from that of the idiot to the man capable of giving a permanent impulse to thought and action.

The Poor Child is scratched against the Rich Child.

The riches of the well-to-do give their children—who, as we have seen, are not necessarily the most capable—an immense pull in life's competition with the sons of the poor, with the result that, certainly in the great majority of cases, the poor man's child is beaten. Putting on one side the question of the father's personal influence in the way of obtaining advantageous positions for his children, who gener-

ally have an opening in his profession or line of business, the rich man is able to equip them with an expensive education which is essential to their getting on in the world. A vigorous personality always counts for much, but training is essential, and training has until quite recently only been obtainable by the well-to-do classes. The English universities and public schools had until lately become the monopoly of the upper and professional classes, to the exclusion, even among these classes, of many who differed in creed from the majority of the community. The doors of every profession were barred except to those who possessed capital, and the children of the poor were frequently unable to obtain even the elements of book knowledge, except in Scotland, where primary education had the start of England by three hundred years. The fact that as many as 41 per cent. of persons married in 1839 were unable to write their own names, illustrates how enormously a large mass of the community must have been handicapped by their want of training.

Not only have the richer classes been able to start their children with capital and a better training than their poorer neighbours, but the poorer classes have—and this, too, in comparatively recent times—been actively repressed. We can in this connection recall the fact that before the sixteenth century, English labourers were compelled to receive wages fixed in

some cases by law, and in other cases by justices, who were often themselves employers of labour. Their wages were determined chiefly by the price of provisions, and in order to prevent migration with a view to the bettering of their wages, they were confined to the place of their birth by the imposition of very serious punishment, if they left their native places to work elsewhere. It is not sought in any way in these pages to adduce these instances of what we should now call unfair dealing with a view to bringing discredit upon the holders of wealth. We have no reason to suppose that our forefathers were consciously unfair, and there is little doubt that many usages current at the present day will be viewed by our descendants as gross outrages upon the principles of justice as understood by them.

Each generation acts according to its own lights, and if our public conscience is sharpening, and our ideas of right and wrong are becoming clearer and are ruling our actions more emphatically, we must remember that this moral advance is a heritage which, like our intellectual and material possessions, we owe to our ancestors, and we may humbly endeavour that this, the most worthy of all possessions, shall not be lessened as it passes through our hands.

The point that is desired to be emphasised is the want, in civilised communities, of advantages equally

distributed to every child born within the community. Without this condition the united effort of the community can never reach its maximum, for much individual power is suppressed, and much incompetency is bolstered up in quite an artificial manner, and competition fails in great measure to bring forward the most capable competitors.

Modern Democratic Attempts to equalise the Struggle.

While this is an undoubted fact, it seems pretty certain that latterly a change has come about in the direction which gives more scope for individual attainments irrespective of birth and wealth.

Organised efforts are being made to connect the Board Schools with the universities, so that the children of the poor may, if capable enough, climb at once into the professional classes. In the interests of intellectual effort this is very desirable, for the universities will then draw their students from a larger area, and men possessing brain power will be rescued from mere mechanical pursuits. One can hardly explain, on the assumption of race superiority alone, the wonderful potentiality of the Scottish Lowlands, the birthplace of so many who have been distinguished for personal attainments, for the East Coast Englishman is of the same blood as the Lowlander, and the division between England and

Scotland is by no means an ethnological one, it is rather a political division of the old kingdom of Northumberland.

But it may more reasonably be explained by the excellent primary education throughout Scotland, and the link that has long ago been formed between the universities and almost every parish in the country. The best education the country can produce has for many years been within the reach of every thrifty farmer, who, if he has a clever son, can pay the relatively small cost of his education.

England has been hitherto a laggard in her educational system, but education is now at last being brought to the door of the poor as well as of the rich. Primary education has been recast, and the universities and colleges in the great centres of population, and suited to the wants of, and within the means of, the poorer classes, are now being established, and an altogether different set of students are being equipped for the intellectual battle of life, students that are drawn not alone from the ranks of the English gentry, but also from the lower middle and artisan class.

By the institution, amongst other means, of technical schools and colleges, the mechanical arts can now be learnt at little or no expense by the children of the poor, and organised public bounty is replacing occasional private patronage.

Thus not only have the poor an increasing chance of rising into the upper ranks of life, but the upper classes are beginning to regard occupations, at one time beneath their notice, as, after all, most suited to the less bright and capable of their children, so that there is a greater passing up and passing down of the ladder of life than was the case some fifty years ago. The surgeon and medical practitioner were at one time looked down upon and classed with the shopkeepers, and trade in all its branches was viewed as a necessary occupation, but only to be undertaken by the uneducated and unrefined. But nowadays parents are taking what appears to be a more commonsense view of the question. Their sons cannot all of them be landed proprietors, clergymen, lawyers, or soldiers, and they are, therefore, sent to banks and offices and breweries, or may be they are exported to grow oranges or to mind sheep in one of the colonies. Positions in life once looked down upon are now thought better of, for men and women do not speak ill of the positions which may be occupied by their children or by their near relatives.

But while it would appear that we are beginning to give fuller play to individual power and industry, no one would be prepared for a moment to assert that these qualities have as yet free scope for their action. Still the tendency has recently been in the direction of a breaking up of the more artificially imposed

barriers between class and class, so that wealth and power is more readily accessible to those who were once debarred from all hope of it by birth; while the children of the well-to-do can take up positions which were at one time thought to be quite unworthy of them. This, then, seems to be the tendency of modern democratic effort, but it is very questionable whether the result eventually achievable is one which, if understood, will be very acceptable to the democracy. Class distinctions of a very artificial kind are, undoubtedly, being rapidly destroyed, but only by the reconstruction of others of a most enduring character. The advantages which the future holds out are, as they always have been, to the few and not to the many, for the struggle and competition is still there, and all cannot come in abreast. By a more complete and thorough sifting from all classes of the capable and intelligent, we are forming, and shall continue rapidly to form, aristocracy of real innate worth and distinction, separated more and more sharply from the masses, as each generation goes by.

We can hardly doubt that the more capable will always have at their disposal more to satisfy their wants than the relatively incapable masses will have, for society will always continue to expend upon the musical composer or upon the skilful engineer a care which would be thrown away upon a man capable of only a limited development, since the resources of a

community, nay of the whole earth itself, are strictly limited, and a due proportion only of these resources must be utilised as necessity dictates. It is quite possible that the present standard of comfort of the labouring classes may be in the future greatly raised, and their horizon widened; still, relatively to others, they will always be poor. If everyone is able to dress in silk and to eat lamb and green peas, then this privilege will cease to be valued, for we set store not on what we possess, but on what we do not possess. The field and town labourers to-day eat better food, dress better, and have far greater advantages than had their fathers, yet relatively to other classes they remain what their fathers were. They are "poor men," they pity themselves, and the more ambitious strive for what they see others in possession of. At the present time the poor man may, with some show of reason and hope of succeeding in greater things, be discontented with his lot, and wish for other pursuits and other advantages, for which he may feel himself to be, and in many cases is, most aptly fitted; but if the present tendencies continue, whereby the best amongst them rise to higher things as the necessary consequence of their ambition, there will not be found amongst the labourers of the future any considerable number left who will have sufficient innate capacity to undertake pursuits requiring much mental effort and bodily skill. Class will then be separate from class by real

organic differences, and the idea of social equality, ridiculous enough as it now appears to most of us, will then have become a demonstrated absurdity, as having contained the impossible idea that things that are unlike can be at the same time alike.

Those who Succeed are Not Always the Best.

We cannot leave this question of the struggle between one individual and another without noticing a point of great interest and importance. We have seen that society is giving to the capable of all classes increased facilities to acquire wealth and position, and is tending to form of this capable section an upper class.

Now, unfortunately, this selection is carried out only on certain lines, and it does not follow that this upper class will invoke our entire sympathy and approbation. In biological works we frequently hear of the "survival of the fittest," and the expression is used by biologists in quite a special and technical sense. It does not mean of necessity that the most active or intelligent always survive; indeed, this is far from being a rule of universal application. Often the most fit are inactive and mentally inert, as when the tame duck with useless wings and the mole with useless eyes is preserved while others die off. In these cases the wings and eyes are useless, and, al-

though the animals looked at by themselves would appear to have become less excellent, yet in view of their surroundings they have a better chance than would be the case were their endowments of a higher order. Biologists use then the term "fit," simply in the sense of "fit to get on in the world," and often intrinsically inferior animals and men are "fit" in this sense of the term.

Now, those who are to form this upper class, or classes, of which we have been speaking, will be fit in the technical meaning of the word, for they will have been able best to conform to the conditions necessary for their advancement laid down by society at large. Whether or not these fit will form an aristocracy of high merit will depend upon the kind of conditions with which they have to comply, in fact it will depend upon the selection that society makes.

Does it not appear that the present tendency is rather to give an advantage to the man who is capable, pushing and diplomatic; are we not selecting men with qualities of value in a struggle, qualities which savour still rather of talons and claws, while we are careless of qualities which we have learned already to value as those of a higher order? In following out a train of reasoning like this, where there are no means of obtaining definite evidence, one can only go upon the general impressions of life which it has been in our power to obtain. Do not these impres-

sions force us to believe that the man who most invariably gets on best is he who untiringly follows out his own advantage, who has one end and aim in life, which he pursues regardless of everything else; and that a course of life like this necessarily implies selfishness and want of regard for the well-being of others? We see so many men around us of the greatest capacity, unselfish and unblemished at the same time, and yet they do not get on, but are passed by men who, in most ways their inferiors, possess instinctively the power to follow out in detail that course which leads quickest to success. How often do we not hear of the generosity of the poor, and of the way in which they assist each other in need and sickness? Do we ever ask ourselves if it could not more truly be said that the *generous are the poor*, that generosity almost of necessity implies a temperament unsuited to the neck to neck struggle which society is increasingly imposing upon those of her citizens who aspire to be rich?

Therefore, although we may be thoroughly in sympathy with the democratic changes just alluded to, and may view these as necessarily preludes to a better condition of things, we must not shut our eyes to their dangers, and must not be deceived into looking upon them as capable of achieving by themselves very desirable or final results.

CHAPTER VII.

STERILITY OF THE CAPABLES.

WE saw, in the last chapter, that in social communities the struggle of one individual with another for wealth and power is not a fair and open contest, but that all are more or less handicapped by surrounding conditions, lack of capital, education, or influence. We saw that recently more equal chances for success are being given to all, and with the result that the more capable and pushing are gradually tending to form a new upper class, and thereby draining from the labouring classes all those who possess the qualities we have alluded to.

Are the More Capable Relatively Sterile?

So far we have viewed this as struggle for wealth and position, and have purposely kept out of view its influence upon those who will come after us: this we have now to consider. Provided the successful and capable competitors contribute on an average an equal number of children per head, as do the unsuccessful

and less capable, it is evident that talent will neither increase nor suffer decrease; it will merely undergo a sifting process, and tend to find its place more and more in the ranks of the aristocracy. If, however, it should be found that the successful ones are less prolific, from one cause or another, then talent will tend to diminish, and the aristocracies will tend to dwindle by the side of the more prolific democracy, and will possibly eventually disappear. In assuming this result, we, of course, conclude that there will be comparatively few marriages between members of widely different classes, and we have reason for conjecturing that this will be the case from the fact that distinctions of class have ever been a bar to free intermarriage, even when these class distinctions have been of the most artificial kind.

If so, we are Breeding from our Incapables.

Now there is good reason to believe that the career necessary to individual success in the life-struggle of modern societies is one which carries with it and necessitates relative sterility; and if this is so, we have to face the certainty that talent is being bred out of us, as it were, and that the average capacity of the race must therefore assuredly deteriorate. And whereas, in the animal world, those qualities which determine the success of an individual in the battle of life become stamped upon its progeny, our modern

system entails just the reverse. In the animal world, fitness results in life and reproduction, and unfitness in death and sterility; while amongst men, the capable and successful are rewarded by honour and wealth, but are relatively sterile, and the man that society is inclined to overlook contributes a large percentage to the race of the future.

It would indeed be difficult to conceive any plan more inimical to the future of a race, or better devised to sap and undermine the power of a nation, than that of taking from it in perpetuity those possessed of innate capacity, a result which follows when the best citizens are induced, for the sake of gifts and honours, to relinquish their obligation to the race of being the parents of many children. Such a plan must continually withdraw from the nation those qualities which are most admired, and which, it must be presumed, it is most desirable to preserve.[1] A nation subjected for long to such a treatment can only become, like the mould of a garden from which the produce has been taken for many years, but to which nothing has been added in return, a soil prolific enough in weeds and brambles, but incapable of growing any of the choicer plants.

If, then, we find that our more democratic views of

[1] It is here taken for granted that the successful are the best. This is, however, open to question, as was seen in the last chapter.

to-day are tending to bring about such a result, we must admit the danger into which we are passing, and see whether there is not a way of escape. We cannot but feel a strong sympathy with every plan which tends to place a round man in a round hole, and to develop to the utmost whatever of capacity, whatever of goodness, there may be present at any one time in the social community. Our sympathy for the downtrodden, and our efforts to assist those who are willing to do life's better work, are but expressions of the fact that we live and have lived together socially, because we have it in us to love, and to value the love of others. It would indeed be a sad tale if that love had never acted in perhaps unwise excess, if it had not prompted us to action, which we may afterwards realise is not in itself and by itself the most judicious.

As already maintained, we naturally consider our fellows first, and we study the picture of life around us; our power of foretelling the future and the results of our present actions comes later on. So it is that our politicians, in cases where sincerity is undoubted, have aimed at the betterment of the individual, and the adjustment in the community of individual capacity to suitable occupation. Few have ever asked themselves the question, What will be the result of my present action on the next generation born? For this there is every excuse, for

until recently these questions were unanswerable in the face of our great ignorance of the chief facts of evolution.

Capable and Ambitious Men Marry Late in Life.

When we turn to the experiences of life common to most of us, we shall find, I think, pretty strong evidence that surrounding conditions determine that, as a rule, the capable and ambitious man has fewer children than his fellows. Let us examine some of these facts of common experience. The agricultural labourer, of the intellectual value of whose education I have by no means a low opinion, nevertheless obtains this education without cost. Bred on the farm, he insensibly imbibes from what he sees around him the multifarious bits of information a farm hand requires. The manual labour which he is called upon to perform implies a very varied, although often underrated, skill, but this skill, and, indeed, his whole education, may easily be acquired, and that without cost, by the age of twenty. He is then capable of earning a maximum wage, for he has reached the period of life at which he is a full-farm-labourer, and at forty he does nothing more and receives no higher wage. Now this maximum wage which he is capable of earning at so early an age is sufficient to support a wife and family. In consequence of this condition of things the countryman generally marries in his early

twenties, and selects in preference to an older woman one of about his own age. The pair are married during nearly the whole of their child-bearing period, and have as many children as they, in the ordinary course of nature, can produce. Much the same sort of statement applies to the lower artisan, factory hand, etc. In these cases perfect accomplishment of the set routine of their especial work can be obtained at a very early age, and for the rest of life no further advance is made. The manual dexterity required in most of these occupations is indeed best acquired during youth, and at twenty or thereabouts the full standard of efficiency is reached, and full wages demanded in return. Need we wonder at the fertility of these marriages, or at the swarms of children seen in every street where the town labourers and lower artisans reside. Now, rightly or wrongly, the man who dresses fashionably, who drives a pen or serves behind a counter, is held of much more account than one who pursues the more manly occupations of tilling the ground or of laying drains. How this sentiment has arisen we need not discuss; there it is, and it has the effect of drawing from the agricultural and lower artisan classes the more ambitious and capable, and turning them into clerks and shop attendants. The slightly-increased wage is not more than is required in the new position, and is expended on dress and those appearances and pleasures which associate

themselves with town life. The future has, no doubt, possibilities, for the clerk may rise, and the shop attendant may become himself a master, and with these possibilities in view most are inclined to wait in hope, many fondly believing in their power and certainty of eventual success. Marriage, however, is a very serious thing, for though the country hand is comfortable enough with his fifteen shillings a week, free cottage, etc., and a wife used to roughing it, the clerk has to mate with a woman who has to be dressed like a lady, and who has placed a foot on that ladder which strikes all who find themselves upon it with the folly of wishing to appear to be on one rung above that on which they really rest. His means are, therefore, quite inadequate for marriage, unless with discomfort and privation, and it tends, therefore, to be postponed. This especially will be the case with those whose capacity is opening out a brighter future, and who would naturally hesitate before they imperil this by a course which, to say the least, might complicate the issue.

A step further we come to occupations which require a long preliminary training, and we find that the time of marriage is postponed maybe to the later years of life. An artist requires years of careful training before his work can reach a standard which is of marketable value, and even then his progress is generally delayed while a connection is being estab-

lished, and a reputation built up. The manufacturer requires general education of a fairly advanced kind, to be followed by a more or less protracted acquaintance with the special business to which he may be devoted, an acquaintance which tends to be wider and of greater value as time goes on; he frequently has to wait for openings only obtainable on the decease of those with whom he is associated. The lawyer and doctor are only able to marry comparatively late in life owing again to the prolonged and special training required of them. The medical student must continue his studies for at least five years after he has left his school, and then almost invariably continues for a few years to act as assistant or partner, content to learn the practical aspects of his profession, with but a small monetary return. Amongst these the most ambitious aim at special knowledge of some small branch, and here again a longer training is required and years of patience, until their work has received sufficient recognition to bring the rich harvest to which they ultimately aspire.

Many Unmarried Persons among Upper Classes.

For such reasons ambitious rising men fear marriage, and the possibility of large families. In many cases marriage is never contracted, and the middle and upper classes are full of men and women living single lives, without contributing their share to the production of

the race. The lower classes, less hampered by a sense of prudence, contract marriages most freely, increasing thereby the relative fertility of their class. While the success of a woman in the upper classes who has several daughters to dispose of is proverbially precarious, we read that in the East End of London every girl in the lowest classes can get married, and with hardly one exception does marry.[1] Those in the upper classes who marry at all do so, as already remarked, at a later period. In verification of this fact we have not only the statements previously adduced from the circumstances of every-day experience, but we also have statistical information at hand in the Forty-Ninth Report on Births, Deaths, and Marriages, where we can find the average age of marriage given for a variety of trades and occupations as follows:—

AVERAGE AGES AT MARRIAGE, 1884-85.

Occupations.	Bachelors.	Spinsters.
Miners	24·06	22·46
Textile hands	24·38	23·43
Shoemakers, tailors	24·92	24·31
Artisans	25·35	23·70
Labourers	25·56	23·66
Commercial clerks	26·25	24·43
Shopkeepers, shopmen	26·67	24·22
Farmers and sons	29·23	26·91
Professional and independent class	31·22	26·40

We shall see from a study of this table that marriage is contracted at a more advanced age by

[1] "Labour and Life of the People," p. 472, by Miss Collett.

those who occupy what in the world's estimation are high positions, and this implies diminished fertility on the part of the women. We should expect from common observation that the younger women would be more prolific, and this is borne out by exact statistical observation. Matthews Duncan[1] concludes that women who marry from twenty to twenty-four are the most prolific, and that the only period which at all rivals this is the five years from fifteen to nineteen inclusive, and that women married later in life than twenty-four are distinctly less prolific.

Lower Class Marriages are the Most Prolific.

Not only do the wives of the working classes produce individually more children than those of the professional classes, but, owing to these earlier marriages, generations succeed each other with greater rapidity. In order to realise how soon a slight advantage like this tells upon the composition of the race, we will suppose for the nonce that the labourer's wife A marries at twenty-three, and the lawyer's wife B marries at twenty-six, and that they have the same number of children, in each case four. In the case of A the population will double, say roughly, every twenty-seven years, and in the case of B every thirty years, allowing in each case four years for the birth of the

[1] "Fecundity, Fertility, and Sterility," second edition, chapter xiv.

family. As we shall see by the following table, the population produced by the labourer's wife A will in 270 years be 2,048, while the population produced by the lawyer's wife B will be half as much, namely, 1,024 in the same period.[1]

No. of Population.	Years required to produce it.	
	A	B
4	27	30
8	54	60
6	81	90
32	108	120
64	135	150
128	162	180
256	189	210
512	216	240
1,024	243	270
2,048	270	300

As regards the men, it is also probable that those who marry at thirty will on the whole be fathers of smaller families than those who marry at twenty-five, even did they mate with women of the same age. Of this, however, I cannot adduce reliable statistical evidence.

Their Infant Mortality is Greater.

The lower classes appear, therefore, to be more

[1] For the sake of simplicity the ages at which the men marry have been omitted; their inclusion would make the case even stronger.

fertile; they more frequently marry, and they marry at earlier and more fertile ages.

On the other hand it must at once be admitted that they manage to rear a smaller percentage of their off-spring. The mortality amongst the infants and children is often alarmingly great through ignorance and neglect on the parent's part.

While, therefore, the lower classes are undoubtedly the most fertile, it is not certain how far this is counterbalanced by the lower mortality which exists among the children and youth of the upper classes.

Artificial Restriction of the Family.

That the counterbalance is not complete is generally believed, and we must view with dismay any agencies which tend still more to make the middle and upper classes sterile relatively to the lower. There can be little doubt that this has recently, and to an increasing extent, been brought about by the wilful avoidance, on the part of the parents of the middle and upper classes, of the full duties of parenthood. It can no doubt be urged that whereas, in many instances, the care of one or two children can be undertaken in such a manner as to insure their careful upbringing and education, the rearing of a large family would be quite beyond the power of the

parents, and would lead to their neglect, or deprivation of some of those advantages which we have already seen to be so necessary for life's struggle.

However true this may be, and however we may sympathise with a parent's desire to do his best by his offspring, it is likewise true that this is an important means, and probably one of greatly increasing importance, by which the upper and middle classes are becoming, relatively speaking, sterile. It is probable, too, that this sterility will be mostly found in the case of those who rise in life and have a longer and more difficult battle to fight, and who have, therefore, most cause to avoid unnecessary complication.

Fertility of French and English Marriages Contrasted.

We can see very clearly in the pages of contemporary history the disastrous effects which may follow diminished fertility. Owing to custom, and subsequently to legislation, property in France is divided equally among the children of a family; and in consequence of this, were there many children to a marriage, this property would be split up into smaller and smaller portions, insufficient at last to furnish the necessities of life. Among the rural population, a farmer by thrift can live and marry on his small

farm, but half the farm would be a piece of property upon which no one could live an independent existence.

It is necessary, therefore, that this property should be passed on intact, and this can be done when on an average a farmer brings to maturity two children. Of these, on an average, one will be a boy and the other a girl, so that by adjustment farmer A can marry his daughter to farmer B, and marry the daughter of farmer C to his own son. In this case the son of farmer A gains by his wife's dowry what his family lost by his sister's marriage. As a result of this artificial limitation of the family, the population of France remains stationary, there is no pressure of numbers, and by thrift and care the people are prosperous and happy. While, however, this may suit the convenience of individual French men and women, it is fatal for the future of the French race, who are becoming insignificant in numbers and influence as compared with those nations whose citizens have more fully accepted the duties of parenthood. It is interesting in this relationship to contrast the births, deaths and marriages, together with the estimated population of France, with those of the United Kingdom, which may be done by reference to the following table taken from Tables 40 and 54 of the Fifty-Fourth Annual Report of the Registrar General's Returns.

POPULATION, MARRIAGES, BIRTHS, DEATHS.

Year.	United Kingdom.				France.			
	Population.	Proportion per 1000 Persons.			Population.	Proportion per 1000 Persons:		
		Mar.	Bths.	Dths.		Mar.	Bths.	Dths.
1867	30,409,132	15·2	33·8	20·8	38,188,749	15·7	26·4	22·7
1871	31,555,694	15·4	33·7	21·5	36,544,067	14·4	22·6	24·81
1875	32,838,758	15·3	33·9	22·1	36,638,163	16·4	26·0	23·0
1879	34,302,557	13·8	33·3	20·5	37,365,544	15·1	25·0	22·5
1883	35,449,411	14·4	32·0	19·6	37,866,000	15·0	24·8	22·2
1887	36,598,235	13·5	30·7	19·0	38,320,000	14·5	23·5	22·0
1891	37,795,475	14·6	30·4	20·0	38,343,000	15·0	22·6	22·6

We see that from 1867 till 1891 the population of the United Kingdom has increased twenty-five per cent., but that of France has remained stationary. While the marriage-rate—the number of persons married per 1000 of the population—is about the same in both countries, the births are over fifty per cent. in excess of the deaths in the United Kingdom; while in France they are but very slightly in excess. It cannot be doubted that, in very large measure, it is due to this relative sterility that France has failed as a colonising power. The French have ever been full of enterprise, and have long desired to establish colonies, but they have in the main been ousted by the British. Colonisation to them has been an ambition, an idea, but not a necessity; to us the alternative has been overcrowding and misery on the one hand, and extensive emigration on the other.

Can we wonder that British necessity has overmatched French vanity? One cannot read the accounts of the struggle between the British and French in North America, antecedent to the War of Independence, without feeling that from the first the issue was certain. The French, who took the palm in enterprise and exploration, were nevertheless rapidly outnumbered by the British settlers, who crowded out of their own congested country into the new land, and increased there with enormous rapidity, the population doubling during the period of fifteen years in many districts.

It is in their relative fertility by the side of the French that the English-speaking race, at first a smaller people, have now far outnumbered their Gaelic neighbours, and have peopled the choicest portions of the inhabitable world, and formed dominions by the side of which France is already becoming a small and unimportant province.

Possible Swamping of the Capables by the Incapables.

We have here, then, a demonstration of the effects of diminishing the fertility of a group of persons, and, returning once more to a consideration of the relative infertility of the upper classes in our own country, we cannot doubt that, if the present tendencies continue,

we shall here also find that the ranks of those who possess the qualities suited to worldly success will increasingly be outnumbered by those more deficient in these qualities. If we tend to the production of aristocracy of innate worth, there is a danger that these aristocracies will die out, or, at any rate, that the number of capables of whom they are comprised will constitute an ever-diminishing number of the whole community.

Artificial Restrictions at Present Most Disastrous.

It may be truly urged that, at some time or another, the present increase of population must come to an end, for as new countries become filled up, the limits of subsistence must at last be reached. The discovery of America, Australia, and the opening up of vast tracts of country in Africa and Asia, has for some hundreds of years permitted certain European nations to increase their birth-rate above their death-rate, and we are so accustomed to such a condition of things that we do not realise that it is exceptional, and that countries, once they have reached a stable condition, only permit of the maintenance of a given number of population. Increased care and knowledge in agriculture may, as time goes on, gradually allow of a slight increase in the number of the inhabitants, but this will be slight indeed, as compared with the present ratio of increase.

We may therefore rest assured that, at some time or another, we shall have to reduce the birth-rate to that of the death-rate,[1] but we are certainly not called upon to do so at present. It is the experience of many men of practical knowledge that at the present time any healthy Englishman, who is fairly capable, industrious and sober, will be able to earn a living for himself, wife, and family. He may have to face a possibility of temporary misfortune, and even catastrophe, in the event of sickness, but his chances are as good, and the comforts that he can obtain for his wage are greater than those of wage-earners in other countries. We are not, therefore, called upon at present to diminish a population which, by its increase, has been enabled to possess itself of a large portion of the inhabitable world, and upon whose future increase will depend in great measure our faculty for keeping it; but we are called upon to see that this increase is derived from the best, and not from the worst, members of the community. It will be most disastrous not only to our Empire, whose strength depends in great measure upon the numbers of our citizens, but also to the quality of the race, if the more prudent and capable are bred out of and eliminated from the community. These, in the nature

[1] See a most instructive paper by Dr. Ogle in the Journal of the Royal Statistical Society, June, 1890.

of things, will be the first to limit their fertility, no doubt to their individual advantage, but to the detriment of the race at large. The work on population by Malthus reads like a modern book. His contributions to social, and his stimulus to biological science can never be underestimated, but his advocacy of those measures which insure relative sterility, such as late marriages, etc., will lead to the final extermination of those who follow his advice. The world will fall to the share of those who produce most offspring. Let us be sure that in our own nation it shall not be to the offspring of the deteriorated, but that the generations that succeed us shall possess those qualities of mind and body which we admire most among our fellowmen, and which will only be preserved to the race if those possessing them carry out fully their duties of motherhood and fatherhood.

CHAPTER VIII.

OBLIGATION IN PARENTHOOD.

OUR conclusion, based on the evidence detailed in the preceding chapters, has been that our race, viewed from a physiological standpoint, is not on the way towards improvement.

I do not feel that this is an alarmist view of the question, even though it points in the direction of both the physical and intellectual degeneration of our countrymen. It is a view based upon facts, and forced upon us by the knowledge of our surroundings gained impartially in other fields. Still, all social problems are of extreme complexity, and one must not lay too much stress upon any individual effort to gauge them. It will be sufficient for all practical purposes if attention has been drawn to these questions, and a serious inquiry started.

It may be urged that, after all, the fears expressed are groundless in view of other facts not understood, and that humanity, if left to itself, will continue for another few thousand years making no important change in its innate racial qualities. But even if

this is so, there is one point which stands out clearly in this discussion; and about this point there need be no shadow of doubt, for of its truth, humanity has had wide experience. It is, that we can improve our race by adopting the one and only adequate expedient, that of carrying on the race through our best and most worthy strains. We can be as certain of our result as the gardener who hoes away the weeds and plants good seed, and who knows that he can produce the plants he wants by his care in the selection of the seed. The human animal varies as much or more than the dog or pigeon, and there can be no doubt that just as by selection, all the varieties of dogs and pigeons have been bred from one or two original stocks, so races of men could be produced as different from ourselves as the tumbler from the wood pigeon, or the bulldog from the old Sussex hound.

Are we prepared to carry out Selective Methods?

So much for the extreme possibilities of the future, which we need hardly consider; for the present, humanity would be glad enough to be represented by men and women of our best types, sound in lung and limb and brain, full of bodily vigour and capable of enjoying exercise both of body and of mind. One cannot for a moment doubt

that, by selection, England in a hundred years might have its average man and woman as well endowed in body and mind as are the best of us to-day. This is not much to claim, for this potent agent selection has formed the higher animals and man himself from lower forms, and has evolved the multitudinous varieties of structure and form we see around us. What we may more reasonably doubt is whether our countrymen will have intelligence and unselfishness enough to bring this about, to sow where others will reap, to distract their thoughts from the pursuit of self-interest and turn their attention to a course of action which will produce its results when their individual lives have passed away.

Rights of the Individual, and Obligations to the Community.

But even here the outlook seems hopeful, for no historical fact is more striking than the gradual subordination of individual interests to those of the community, which for many years has been going on. The clamorous appeals for personal rights are giving way to a growing sense of obligation and a desire to further the interests of others. At a time when the labouring classes had too little power of establishing their claims to just treatment and proper consideration, the sense of public obligation was

naturally not so strong. Men and women were struggling, and very rightly, for what unjustly was withheld from them; for though men had united in communities for self-interest and self-defence, wealth and its transmission had set up barriers between those who felt their equality as men, and who resented social disqualifications due probably to the ill fortune of their ancestors; under these circumstances men thought and talked more about their rights than about their obligations.

Long ago, when the family or clan formed a unit, the right of the father over the children and the women was a part of a very necessary discipline upon which probably the existence of all depended. These ideas have very naturally survived, for custom clings with wonderful pertinacity, and we have had the strange spectacle of the house divided against itself, the father clinging to his old rights, the wife and children clamouring for their new ones. As an instance which illustrates how long the woman continued to be viewed as part of the property of her husband, it is but necessary to recall the fact that only since the Matrimonial Causes Act of 1858 was it rendered impossible for a husband after deserting his wife to return to her and *lawfully* possess himself of all the property she had herself acquired during the time of his desertion. So too with our old ideas regarding parental rights, which were so tenacious a

survival that until as late as 1891 a father could not forfeit these either by contract or neglect. Before the Act to amend the law relating to the custody of children passed in March, 1891, a man who had deserted his children could afterwards insist on their returning to him, and, although a reprobate in every way, he could claim them from the parish or custodian who had been responsible for their upbringing. These and many other injustices have been and are being removed, and it must be remembered that this has been done not by a forcible adjustment gained by strength of numbers, but by the force of public opinion and the sense of justice of all classes and of both sexes. The rights have been given, they have not been taken; the poor have had rich men on their side, and the promoters of women's independence and advancement have in large numbers been the men themselves. It is true that much unnecessary inequality remains, and that we treat certain sections of the community in a most undesirable fashion—witness the herding of the profligate with the unfortunate or aged pauper—but the very fact that justice has come as the result of claims put forward and recognised as just, rather than at the point of the sword in open rebellion of the many against the few, shows that as a nation we are instinct with the feeling of obligation. There is a feeling that whatever is right will ultimately be done, that so-called in-

justices are survivals of past ages from which emancipation must take place, and that all we have to encounter is that right and necessary conservatism which adapts itself slowly and cautiously to changing conditions of things, clinging to that which is because the present is the best to which we have yet achieved, yet willing to change this for what we have reason to believe will be really better. With this modern development of the sense of obligation, we may anticipate that all those who are really dependent upon their own actions will be seriously considered, and have their welfare fully assured.

Rights of Children and our Obligation to them.

Political agitation has in the past been one of the most potent forces by the movement of which men and women have obtained redress from their disabilities, and have put forward their own views and enlisted sympathy in their own troubles. But infants and children, although provided with most effectual means of calling attention to certain of their personal wants, are unable even to formulate grievances of which they are not conscious, and posterity has naturally no voice in determining the course of our present actions although its very existence depends upon these.

This is already partly realised, and there are not

so great a thing as racial reconstruction can be accomplished on certain well-understood lines, then from what we know of the stuff that is in humanity this racial reconstruction most assuredly will be carried out.

Social Philosophers and Social Reformers.

There are two classes of persons—Social Philosophers and Social Reformers; the former discuss what might be done, the latter endeavour to bring about that which it is possible to do. Nothing would be easier than to frame a set of suggestions which, when followed out, would lead to the desired ends; but as reformers (not philosophers) we have only to discuss those suggestions which the public would be prepared to view with an open mind and eventually to act upon. It is true that this will take us but one step towards the end, but the futility of discussing further steps, for which people are not prepared, has often enough been demonstrated in matters social. After all we have not to argue these questions in the abstract; they are associated in their very essence with the qualities and nature of the average citizen, and we have to think of what will best appeal to him. He sits as the judge of the case; he has to be instructed; his sentiments, and probably his vanity,

enlisted; if we go too far he will dismiss the case, and it may be long before it can be taken up again.

Segregation is Not yet Practicable.

No one in their senses would at the present moment venture to bring in a Bill for the segregation of criminals and vagrants, for we are not prepared for such a measure. A certain number would, no doubt, be strongly in its favour, but they would be in a small minority. At present the community at large have hardly even discussed their obligations as race producers, and the enforcement of these obligations could only follow a strong growth of public feeling and public practice. Long, too, before the question can be discussed in a practical form, the criminals and vagrants must be separated from the deserving poor; it is probable that this step would commend itself to all, indeed in all probability the present system continues to exist solely on account of a widespread ignorance of the real state of things. Our workhouses and institutions for the relief of the poor have never elicited much personal interest; they are rarely visited by the public, who have never realised the scandalous herding together of the very scum of humanity with the respectable but unfortunate and aged of the labouring class which is nowadays prevalent. Once this state of things were ended,

once the public could see the inveterate criminal and vagrant class by itself, it would be able to deal with it on rational lines. It would view it as a hopelessly inferior class, having no place among the workers of the State; a class to be cared for and controlled, but whose perpetuation, on the score of pity for the offspring, must in duty be prevented.

Segregation no New Idea, and Ultimately a Necessary Practice.

The idea of segregation is no new one, for at the call of religion man and woman have in most countries, and in all times, separated themselves from their fellows. They have denied themselves the pleasures of love, and of the table; they have foregone worldly ambition, and have lived lives often of utter solitude, and of miserable privation, in order to fulfil what they considered to be a higher duty. Believing in the advent of some sudden change, of the destruction of the present condition of things, they naturally thought and cared little for the preservation of a race, destined soon to have spiritual existence alone. Thus, it came about that millions of the most thoughtful and noble-minded men and women have in the past committed the fatal mistake of leaving the rest of humanity to carry on the race. Theirs was a voluntary segregation which must have

had the most direful results upon the race. That which we speak of is an enforced segregation which would eliminate from it some of its worst qualities.

Were this segregation proposed, it would be impossible to oppose it except by prejudice and that inertia which every change has to encounter. If our pity is enlisted on the side of suffering, it must be used to prevent the production of those who are bound to suffer. Parents on an average produce from four to five children, and the criminals and incapables are reckless as to the condition of their offspring. The "ins and outs" of our workhouses take refuge there; they live on the organised charity of the land; they have not the physical and moral power to support themselves; they can leave at any moment and return mothers and fathers of children, who, like themselves, must be clothed and fed by the toil of others. Those who cannot support themselves, from poverty of physique, disease, or mental or moral incapacity, are yet permitted by the community to exercise the functions of parenthood, which, in its nature and essence, implies an excess of power over and above that which is required for the individual's own self-preservation.

The Masses must be Taught the Main Facts of Heredity and Evolution.

In addition to our attempts to separate the deserving poor from the criminal and vagrant classes, which should be done on the grounds of common decency, every endeavour may with advantage be made to further a clear understanding of the action of selection in general evolution, and in this undertaking we shall have the assistance of the workers in most sciences; for everywhere the thoughtful man is regarding the facts in his own department under this new light.

By pointing out the marked racial change resulting from the action of selection, which shows itself every ten years in the production of some new variety of dog or pigeon, and every year in the production of many varieties of flowering plants, we can convince the uninstructed by ocular demonstration which they cannot deny. They must learn to look upon mankind as organically related to other animals, and it must be pointed out to them that the facts of human evolution are in the main similar to, and form but a section of, the facts of general evolution. It must be pointed out that in many families there are perhaps one or two of the children, bred under conditions like the rest, who are delicate, of ungovernable temper, or

have some deformity. They will know by experience that these children will in their turn have children like themselves, and the wonderful benefit to the race which would result from the selection of the strongest in mind and body as race producers will of necessity follow. It would then be possible to develop a strong public feeling against any marriages contracted by obviously sickly people, for the suffering which may be inflicted by producing sickly offspring may reasonably be urged against those who would otherwise be willing to gratify their convenience or personal predilection, and perhaps eventually this might lead to prohibition of such marriages. It should be pointed out that temperaments, and moral and mental qualities, are transmitted just as surely as physical traits; that all, in fact, of the qualities of the future race will depend upon those which are blended together to-day in parenthood. It follows, therefore, that the greatest of all responsibilities is taken by the assumption of parenthood, and everyone may well ask himself or herself, before undertaking it, Will the world be better for any more of me?

The End and Aim of Marriage.

To-day we are apt to be cautious before marriage; we are very keen to be assured on the question of dowry, and one hears of private inquiry as to money

matters through the family solicitor. We have pride in so-called "birth," which is of very fictitious biological value, and think much of an alliance with one of good family. Men and women have already, therefore, learned to tread with caution on the pathway which leads towards the altar, and for the most part no longer give full play to vanity and passion pure and simple. We are prepared, therefore, to look before we leap, but we look in the wrong direction, we avoid inconvenience and plunge into catastrophe. The reason for this is that we are but partially educated in the real ends and aims of life, and do not know the course which leads to ultimate success provided we follow it.

Our False Ideas regarding Marriage.

We have instincts, right perhaps in the main, but these have been followed blindly. Pride in illustrious ancestry is most reasonable, and the wish to carry on the family name is allied to that praiseworthy egotism which makes every cat prefer her own kittens to any others. These natural instincts have, however, up to the present led us to desire wealth and position for our offspring rather than robust constitutions and mental activity. We have avoided in many cases, by what we term suitable marriages, poverty and inconvenience, yet in contracting these marriages

we have sacrificed the organic possibilities of our children.

The Stream of Life.

The most superficial consideration of the question will convince us that the organic stream of life is that which is of all things the most permanent. We are so apt to lose sight of the ephemeral nature of rank and wealth. We forget that the gold and silver is constantly changing hands, the houses are being rebuilt, the old landmarks destroyed. Our individual thoughts and passions are, and are then no more; whole families, even races, disappear. Yet man is here to-day, he has come down from remote posterity, and some of us will give our blood in large measure to mankind as he will be found in future ages. In this stream of life the shepherd who weds a healthy, thrifty wife is of more account than an emperor who destroys the chances of his posterity by marriage with a sickly princess. Life is brain and muscle, wealth and position are apart and accessory. In marriage we must bear in mind its end and aim, for the individual lives only till he has reproduced himself; each generation lives only to produce the next. If these facts are once widely understood there can be little doubt that they will influence men's actions in respect to marriage, and with a growing sense of

obligation to others, the ratio of sickly and feeble-minded children may be diminished.

With the judicious selection of parents to be the race-producers, we need have no fear as to the care that modern civilisation and preventive medicine bestow upon the individuals. If the community undertakes its own selection we can dispense with the selecting influence of the micro-organism of whooping-cough, scarlet fever, or tubercle. Our remedies and our digested foods may be used with advantage to help the members of a robust and energetic stock through those dangers which must at all times beset them.

APPENDIX.

IN Chapter II. we saw that much of the valuable and carefully reasoned results which Weismann had obtained are accompanied by much detailed speculation based upon an extremely limited fact basis. In his later writings especially, the reader who searches for the facts and reasoning which refer to such questions as the non-transmission of acquired characters will find everywhere an abundant commingling with speculations concerning the mechanical process of heredity. I have ventured in the appendix to sketch shortly this speculation of Weismann's, and to give my own estimation of its value.

Weismann was not the first to speculate or found a mechanical theory of heredity; Darwin himself published a theory of "pangenesis," and this was, I believe, the only piece of speculation of which Darwin was ever guilty. That he might picture to himself, by means of material particles, the views that he held of heredity, Darwin supposed that during their lifetime every cell of the parent disengages small living particles—gemmules—which find their way to and are stored up in the generative cells, ready to develop in the next generation into cells similar to those from which they came. This theory was actually framed to support those cases where Darwin supposed that acquired characters are transmitted, for he says in

one of his replies to Huxley's letters:[1] "I do not doubt your judgment is perfectly just, and I will try to persuade myself not to publish. The whole affair is much too speculative; yet I think some such view will have to be adopted when I call to mind such facts as the inherited effects of use and disuse," etc. In the theory of pangenesis the gemmules residing in

FIG. 2.

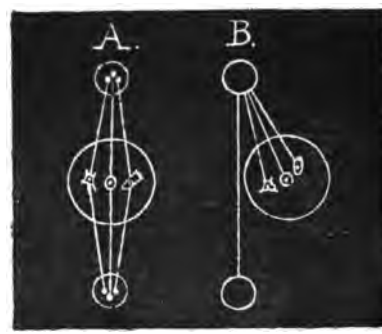

Diagram to illustrate: A, Darwin's theory of pangenesis; B, the continuity of the germ plasm A. An ovum above, full of gemmules (only three of which are represented develops into an individual made up of cells, three of which are shown. These cells give off gemmules, which collect and form the substance of the ovum of the next generation. One can see how the gemmules formed by the body cells will be influenced by any change in these. B An ovum gives rise on the one hand to body cells, and on the other hand to the substance of the ovum of the next generation. A change in the somatic cells does not influence the ovum.

the body or somatic cells will be subject to such influences as affect the cells, and will naturally transmit any change to which they have been subjected to the offspring that they eventually build up. Darwin's view may be graphically represented by Fig. 2. Since

[1] "Life and Letters," first edition, vol. iii., p. 44.

Darwin's time most biologists have come to doubt whether there is any evidence that acquired characters are transmitted at all, and incline rather to view racial change as altogether due to inborn variations, some of which variations have an advantage over others; Darwin himself, as Huxley pointed out,[1] laid less weight on the influence of acquired habits in his later than in his earlier writings. Modern biologists tend, therefore, to be more Darwinian than Darwin in respect to their thoroughgoing adherence to the action of selective influence; but of necessity they discard his theory of pangenesis, which was a pictorial expression of Darwin's lingering Lamarckian tendencies. Let me give some idea of what the Neo-Darwinians picture to themselves as the "process of heredity." It has been known now for many years that every cell in the body, including the sperm cells and ova, are descended from a fertilised ovum. Of these cells of the body all obviously die except those sperm cells and ova which give rise to the next generation, and so on. We have, therefore, a continuing chain of actual organic matter linking every living form with those that are most ancestral and remote, and from these chains all the so-called living individuals that have ever existed have, as it were, been thrown off. Many have emphasised this point, Owen, Haeckel and others; but perhaps Francis Galton must be given much of the credit of clearly stating it as a fact to be remarked, though similar views have more recently been popularised among

[1] "Life and Letters," vol. ii., p. 14.

biologists by the delightful pen of Weismann. The "continuity of the germ plasm," the title by which this view is generally known, expresses the fact that germ substance continues in an unbroken line from generation to generation; a man is similar to his parents because he develops out of a similar plasm. The continuity of germ plasm (*stirp* of Galton), like Darwin's selection, is a fact, not a theory.

Now while Darwin's fancy regarding pangenesis compels one to believe that the effects of use and disuse, the action of disease and mutilation, must be transmitted, the continuity of the germ plasm in the isolated reproductive cells of the parents renders this extremely doubtful. The anatomical conditions actually found are fully reconcilable with the observed non-transmission of acquired characters.

This fact was shortly and precisely stated by Galton in 1875, and by Weismann in his "Studies in the Theory of Descent," published in English in 1882. In 1883, in his essay upon Life and Death,[1] Weismann looked upon the germ plasm as the substance of the germinal or reproductive cells, and on p. 148 he defines "germ" as follows: "I should propose to include under this term every cell, cytode, or group of cells which, while not possessing the structure of the mature individual of the species, possess the power of developing into it under certain circumstances." So far Weismann was a fact man, and gave to the facts observed their true and full significance. Since that time, however, he has speculated

[1] Essay to be found in vol. i.; English translation, 1889.

upon the nature of the germ plasm. To him it consists of ultimate living particles, to which he assigns various and specific purposes, and groups them at will, group within group, like nests of Chinese bones. The biophores (his conceived units) have the capacity of growth and reproduction—a generous concession indeed. They are groups of chemical molecules, far beyond the highest powers of the microscope, and cannot therefore be investigated by our senses; they are conceptions, not perceptions. These biophores are arranged in groups, called determinants, one for every part of the adult which is capable of variation; groups of determinants are termed "ids," and groups of ids are termed "idants," the last being visible in the ovum as a brightly-stained rod of unclean matter. By the multiplication, differentiation, and disintegration of these various groups, the adult body is formed, and Weismann is prepared to explain every step.

Speaking in 1883[1] of Darwin's theory of pangenesis, Weismann remarks: "We become lost in unfounded hypotheses." I think this is a true and allowable criticism, but I also think that it applies in far greater measure to the theory of the germ plasm developed by Weismann himself. It may be pointed out that Darwin placed little store upon his theory, and apologised for its speculative nature, not only in the letters already referred to, but in his work upon "The Variations of Plants and Animals under Domestication," where it appears in a single chapter

[1] Lecture on Heredity, *op. cit.*, p. 77.

at the end of a large work of 800 pages. Darwin here says (vol. ii., p. 349): "I am aware that my view is merely a provincial hypothesis or speculation; but until a better one be advanced, it will serve to bring together a multitude of facts which are at present left disconnected by any efficient cause." Weismann's speculations, equally unfounded on fact, are nevertheless viewed by him as being of sufficient importance to demand the most detailed elaboration. Do not suppose for an instant that I am decrying the use of fancy or provisional hypotheses; the world advances upon the steps, generally the ruined steps, of hypotheses. The value of an hypothesis depends, however, entirely upon whether we can put it to the test of experiment. If it is intangible, then it remains an hypothesis, while the great body of fact workers go on building their sciences, and in the completion of these it has no part. Darwin's pangenesis has no value as an hypothesis, it seems to me, apart from its being a pictorial way of illustrating how use and disuse might be inherited. This latter is a question which can be solved experimentally; pangenesis was a mental picture present to Darwin's mind, and he threw it out for what it was worth. In this picture the gemmules were supposed to pass from the cells of the body through the blood into the reproductive cells, and the experiments which Galton, and subsequently Romanes, undertook to disprove pangenesis by showing that certain samples of blood did not contain gemmules, and that therefore pangenesis did not occur, appear to me to show a want

of appreciation of the fact that Darwin intended this theory merely as a temporary mental picture, and nothing more.

But Weismann puts forward his views in most sober earnest, elaborates the details of his theory, and remodifies his conceptions so that his story may fit in with the fresh discoveries in embryology and comparative anatomy as these are made. Our criticism is simply this, that the hypothesis, being nothing more than a personal conception of the author's, is not to be tested by experiment, and that the author could always escape from the clutch of refutation. We are left, moreover, in the same difficulty with which we started, for by giving his living units the functions of growth and reproduction, which must involve heredity itself, Weismann shunts back the question from animal and plant, which we can see and handle, to particles quite beyond our ken. We may also point out that there is no reason to assume that living matter is made up of little parts, or persons, molecules or groups of molecules; experiment, in fact, strongly contradicts this assumption. Let us see how humanity first obtained the idea that matter is made up of little bits, how we obtained the idea of molecule or atom. The idea is an ancient one, and it is easy to see how it occurred to thinkers even in primitive times. Most solids, such as chalk, sand, and rock, and fluids too and gases, are, when broken or divided, of obviously similar parts. If we break a piece of writing chalk across, and each fragment is chalk—that is, it appears to us to be white and hard, it will write upon

the board, etc. If we continue to break it we shall always have smaller particles of chalk, never anything else. Thus men generalised from their commoner experiences, and got the idea that all things are built up of small parts or molecules. Anaxagoras (70th Olympiad), from experiences such as those just described, in all probability arrived at his theory of elements (homœomeriæ), viewing all things as built up of elementary things of the same nature, flesh and blood of elements of flesh and blood, etc. Similar views are held to the present day, and are an expression of the fact that you can break most things into similar but smaller parts. Quoting from Tait's "Properties of Matter," 1885, p. 21, we find: "But the really extraordinary fact, already known in this part of our subject, is the apparently perfect similarity and equality of any two particles of the same kind of gas, probably of each individual species of matter, when it is reduced to a state of vapour. Of such parts, therefore, whether they be further divisible or not, each species of solid or liquid must be looked upon as built up." It will be noted that the moderns would make a distinction which the ancients did not; a modern will speak of a molecule of a gas or of incandescent iron, but he hesitates before speaking of a molecule of an ordinary solid at ordinary temperature, and would certainly, if an exact thinker, never dream of speaking of a molecule of wood or flesh or bone. If we carefully prepare as perfect a cylinder of wood as we may wish, and divide it into two equal parts, these (unlike the piece of chalk or iron) will not be

the same; the graining will show a difference to the naked eye. The microscope will show that the wood is not uniform in its smallest parts; it is what we may term "organised," the structure being different as we shift the eye along the smallest distance of the thinnest section. The same applies to bone and muscle; in fact, to all parts of the bodies of all animals and plants. The idea, then, of molecule is a conception of an ultimate bit of a substance towards which our experimental breaking has in actual experience partially reduced it, and would never have occurred to the ancients had the commonest objects of nature been, like variegated marble or granite, of obvious heterogeneous structure. When, therefore, we translate this idea to the realm of biology, where bodies are not made up of similar parts, it is obvious that we do this without warrant, in face of our biological experience, and that we are thoughtlessly accepting a physical theory of gases and incandescent solids without appreciating the foundation upon which this theory rests. The fact of the matter is, we are in utter ignorance as to the ultimate constitution of any living matter; but so far as microscopic investigation goes, we learn that it has unlike—not like—parts. Our experience, therefore, rather contradicts the belief that it will be found to consist of ultimate parts, each part having the function of living protoplasm, biophores, or whatever name may be attached to them; and we recall Clifford's rule that we may believe what goes beyond our experience only

when it is inferred from that experience by the assumption that what we do not know is like what we know.[1]

[1] "Lectures and Essays," vol. ii., p. 210.

THE END.

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